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NATIONAL DAM SAFETY PROGRAM. GLEN CREEK DAM (INVENTORY NUMBER N--ETC(U)
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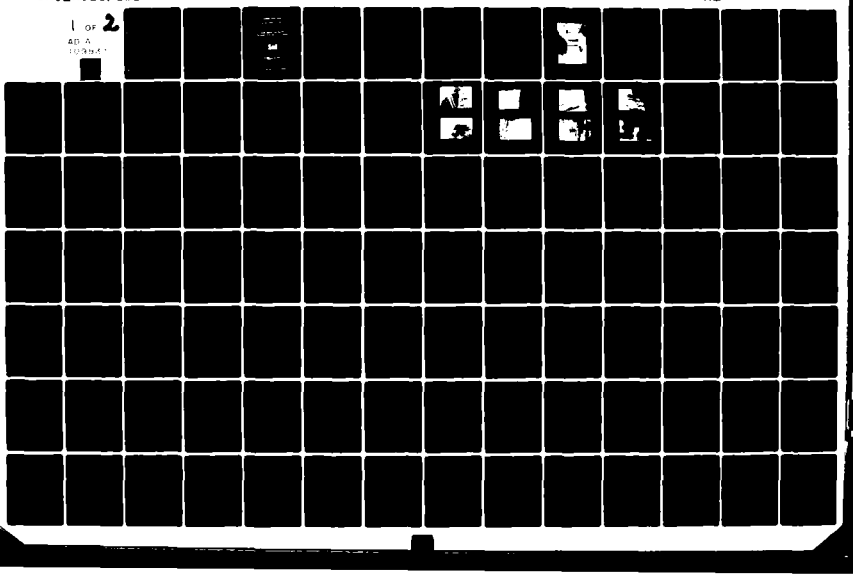

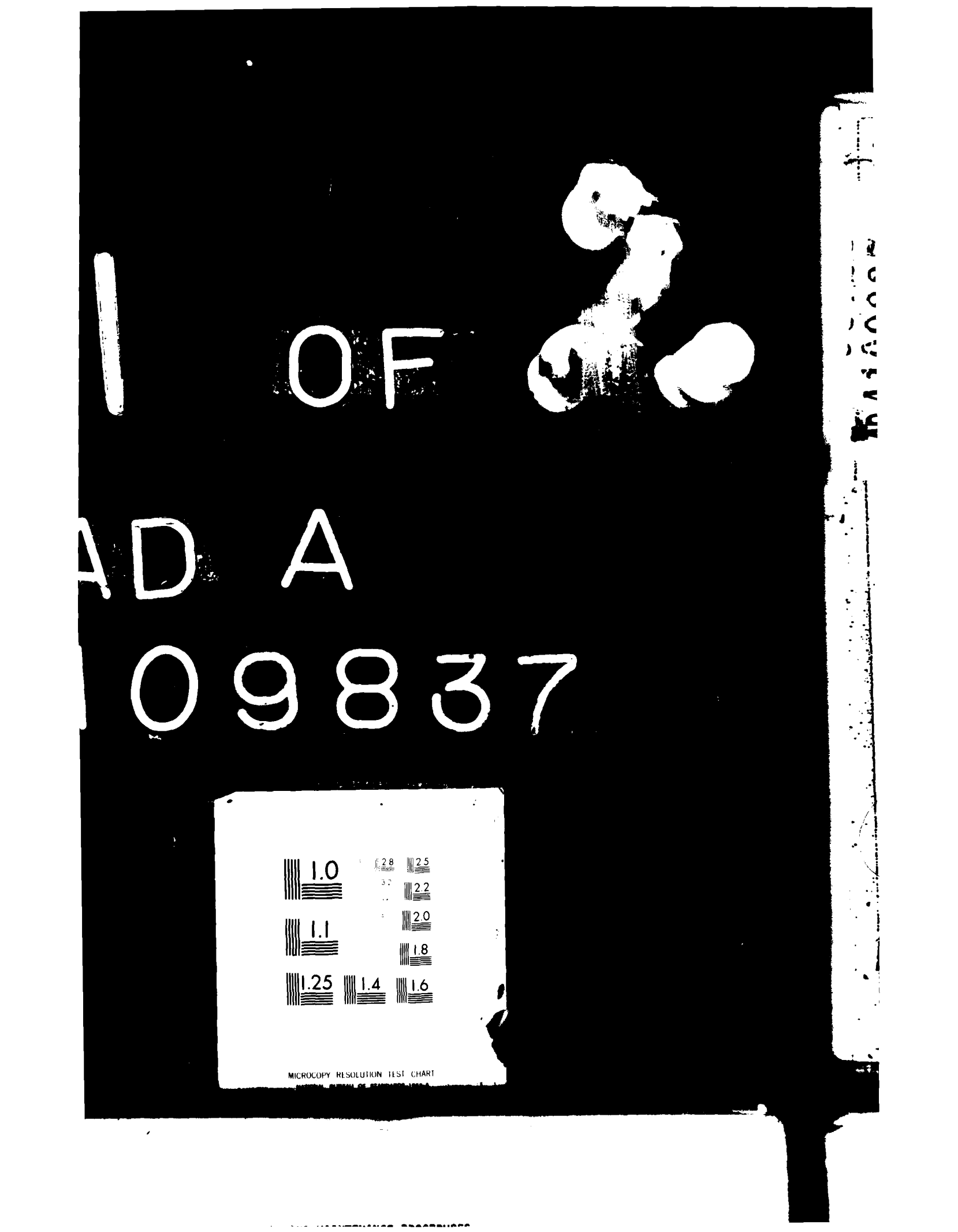
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REPORT DOCUMENTATION PAGE

READ INSTRUCTIONS BEFORE COMPLETING FORM

1. REPORT NUMBER	2. GOVT ACCESSION NO. AD-A109837
3. RECIPIENT'S CATALOG NUMBER	
4. TITLE (and Subtitle) Phase I Inspection Report Glen Creek Dam Oswego River Basin, Schuyler County, NY Inventory No. NY00997	5. TYPE OF REPORT & PERIOD COVERED Phase I Inspection Report National Dam Safety Program
	6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s) GEORGE KOCH	8. CONTRACT OR GRANT NUMBER(s) DACW51-79-C-0001
9. PERFORMING ORGANIZATION NAME AND ADDRESS New York State Department of Environmental Conservation 50 Wolf Road Albany, New York 12233	10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
11. CONTROLLING OFFICE NAME AND ADDRESS Department of the Army 26 Federal Plaza New York District, CofE New York, New York 10287	12. REPORT DATE 22 September 1981
	13. NUMBER OF PAGES
14. MONITORING AGENCY NAME & ADDRESS(if different from Controlling Office) Department of the Army 26 Federal Plaza New York District, CofE New York, NY 10287	15. SECURITY CLASS. (of this report) UNCLASSIFIED
	15a. DECLASSIFICATION/DOWNGRADING SCHEDULE

16. DISTRIBUTION STATEMENT (of this Report)

Approved for public release; Distribution unlimited.

17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)

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18. SUPPLEMENTARY NOTES

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

Dam Safety
National Dam Safety Program
Visual Inspection
Hydrology, Structural Stability
Glen Creek Dam
Schuyler County, NY
Oswego River Basin

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

This report provides information and analysis on the physical condition of the dam as of the report date. Information and analysis are based on visual inspection of the dam by the performing organization.

The examination of documents and the visual inspection of the Glen Creek Dam did not reveal conditions which constitute an immediate hazard to human life or property. However, several deficiencies were noted which should be remedied.

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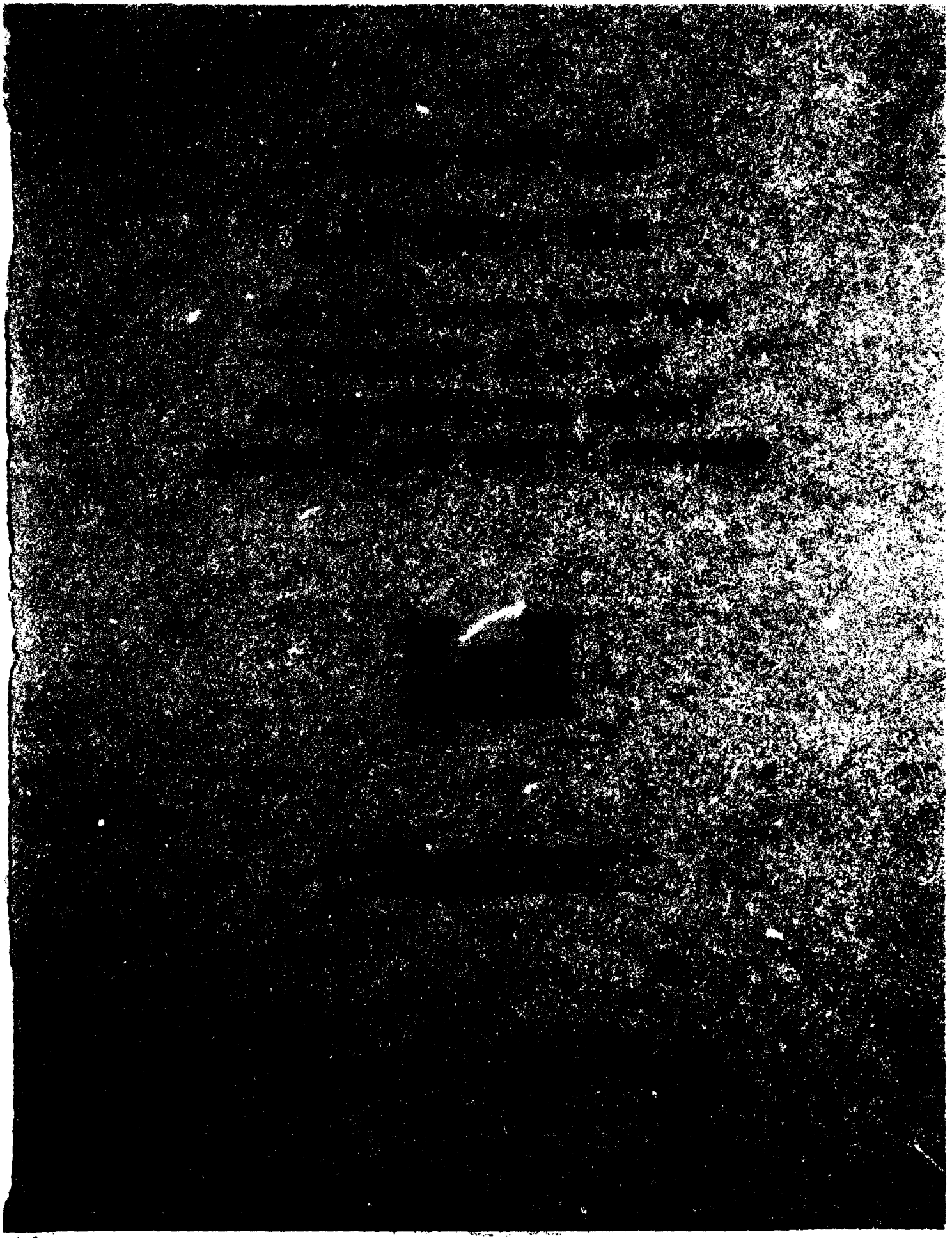
SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

The hydrologic/hydraulic analysis performed indicates that the spillway will pass only 30 percent of the Probable Maximum Flood (PMF) before overtopping. However, overtopping of the abutments in this case of a concrete arch dam is not likely to cause failure of the dam. Therefore, according to the Corps of Engineers' Guidelines, the spillway is assessed as "inadequate".



PREFACE

This report is prepared under guidance contained in the Recommended Guidelines for Safety Inspection of Dams, for Phase I Investigations. Copies of these guidelines may be obtained from the Office of Chief of Engineers, Washington, D.C. 20314. The purpose of a Phase I Investigation is to identify expeditiously those dams which may pose hazards to human life or property. The assessment of the general condition of the dam is based upon available data and visual inspections. Detailed investigation, and analyses involving topographic mapping, subsurface investigations, testing, and detailed computational evaluations are beyond the scope of a Phase I Investigation; however, the investigation is intended to identify any need for such studies.

In reviewing this report, it should be realized that the reported condition of the dam is based on observations of field conditions at the time of inspection along with data available to the inspection team. In cases where the reservoir was lowered or drained prior to inspection, such action, while improving the stability and safety of the dam, removes the normal load on the structure and may obscure certain conditions which might otherwise be detectable if inspected under the normal operating environment of the structure.

It is important to note that the condition of a dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through frequent inspections can unsafe conditions be detected and only through continued care and maintenance can these conditions be prevented or corrected.

Phase I inspections are not intended to provide detailed hydrologic and hydraulic analyses. In accordance with the established Guidelines, the Spillway Test flood is based on the estimated "Probable Maximum Flood" for the region (greatest reasonably possible storm runoff), or fractions thereof. Because of the magnitude and rarity of such a storm event, a finding that a spillway will not pass the test flood should not be interpreted as necessarily posing a highly inadequate condition. The test flood provides a measure of relative spillway capacity and serves as an aide in determining the need for more detailed hydrologic and hydraulic studies, considering the size of the dam, its general condition and the downstream damage potential.

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM
GLEN CREEK DAM I.D. NO. NY 997
DEC #60C-2567 OSWEGO RIVER BASIN

TABLE OF CONTENTS

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM

Name of Dam:	Glen Creek Dam I.D. No. NY 997
State Located:	New York
County:	Schuyler
Watershed:	Oswego River Basin
Stream:	Glen Creek, tributary to Seneca Lake
Date of Inspection:	June 11, 1981

ASSESSMENT

The examination of documents and the visual inspection of the Glen Creek Dam did not reveal conditions which constitute an immediate hazard to human life or property. However, several deficiencies were noted which should be remedied.

The hydrologic/hydraulic analysis performed indicates that the spillway will pass only 30 percent of the Probable Maximum Flood (PMF) before overtopping. However, overtopping of the abutments in this case of a concrete arch dam is not likely to cause failure of the dam. Therefore, according to the Corps of Engineers' Guidelines, the spillway is assessed as "inadequate".

The following problem areas will require remedial action to be initiated within six months and completed within 1 year of notification to the owner:

1. Repair deteriorated concrete on the crest, the downstream slope, around the low level outlet and construction joints.

2. Repair the reservoir drain to working order.

3. Provide a program of periodic inspection and maintenance of the dam, including yearly operation and lubrication of the low level outlet. Document this information for future reference.

4. Develop an emergency action plan for the notification of downstream inhabitants and maintain it during the life of the dam.

GLEN CREEK DAM - OVERVIEW

Phase I Inspection Report
National Dam Safety Program
Glen Creek Dam I.D. No. NY 997
DEC #60C-2567 Oswego River Basin

SECTION 1: PROJECT INFORMATION

1.1 GENERAL

a. Authority

The Phase I inspection reported herein was authorized by the Department of the Army, New York District, Corps of Engineers, to fulfill the requirements of the National Dam Inspection Act, Public Law 92-367.

b. Purpose of Inspection

This inspection was conducted to evaluate the existing conditions of the dam, to identify deficiencies and hazardous conditions, to determine if these deficiencies constitute hazards to life and property, and to recommend remedial measures where required.

1.2 DESCRIPTION OF PROJECT

a. Description of Dam and Appurtenances

The Glen Creek Dam is a 187 feet long concrete arch dam with a maximum height of 65 feet. The upstream radius is 120 feet and the thickness varies from 19½ feet at the base to 4 feet at the crest. The crest is stepped forming primary and auxiliary overflow spillways, totaling 136 feet of weir length. There is a 3 feet by 3 feet reservoir drain located at the left abutment.

b. Location

The dam is located on Glen Creek, tributary of Seneca Lake in the Oswego River Basin. The Glen Creek flows from the dam through Watkins Glen State Park and Watkins Glen, New York.

c. Size

The dam is 65 feet at its maximum height and impounds 172 acre feet at normal pool elevation. The dam is classified as intermediate in size.

d. Hazard Classification

The dam is classified as "high" hazard due to its location, above a heavily used camp and state park, in Watkins Glen, New York.

e. Ownership

The dam is owned by the Finger Lakes State Parks Commission, Trumansburg, New York 14886, (607) 387-7041. Mr. Jesse Miller, Senior Park Engineer, is the contact in the Central Office.

f. Purpose of the Dam

The dam was built to control erosion in the glen, forming a catchment basin for materials and to flatten the gradient.

g. Design and Construction History

Glen Creek Dam was constructed in 1957 for the Finger Lakes State Park Commission. It was designed by Bogema, Gifft, & Jenkins, Ithaca, New York. No other information on construction could be located.

h. Normal Operating Conditions

All flows are passed over the uncontrolled spillway. The only other control is the three by three feet sluice way which is not operational at this time.

1.3 PERTINENT DATA

a. Drainage Area (sq.mi.) 18.5

b. Elevations (ft., U.S.G.S. Datum)

Top of Dam	1070.0
Spillway Crest	1061.0
Auxiliary Spillway Crest	
2nd	1063.0
3rd	1065.0
Low Level Outlet	1014.0
Original Stream Bed	1006.0

c. Reservoir

Surface Area @ Top of Dam (acres)	22.77
Surface Area @ Spillway Crest (acres)	8.70
Storage @ Top of Dam (acre-ft.)	309.0
Storage @ Spillway Crest (acre-ft.)	172.0

d. Dam

Type: Concrete arch dam

Length (ft.)	187.0
Height (ft.)	65.0
Upstream Radius (ft.)	120.0
Upstream Slope	Vertical
Crest Width (ft.)	4.0
Base Thickness (ft.)	19.5

e. Spillway

Type: Uncontrolled overflow control section. Plunge pool at base of dam provides energy dissapation.

Weir Length (ft.)	
Primary	32.0
Secondary	40.0
Tertiary	64.0
Capacity at Top of Dam (cfs.)	7921.0

f. Reservoir Drain

Type: Manually controlled 3 x 3 feet sluiceway.

Capacity at Normal Pool Elevation (cfs.) 322.0

SECTION 2: ENGINEERING DATA

2.1 GEOTECHNICAL DATA

a. Geology

The Glen Creek Dam is located on the northern extreme of the "Alleghany Plateau" physiographic province of New York State. These highland areas are cut by valleys at variable intervals. The valleys are steep-sided with level floors and some moderately sloping hilltops. The underlying sandstones and shales of the Alleghany Plateau contributes a mixture of coarse and fine particles to give a medium textured soil material.

b. Subsurface Investigation

The Erie-Langford association occupy broad, smoothly sloping, till mantled hills along the northern edge of the Alleghany Plateau. The dam is founded directly on the exposed shales in the Glen Creek gorge. No information on any subsurface information or testing results could be located.

c. Design Records

No design records or calculations could be located for the Glen Creek Dam, other than the plans located at New York State Department of Environmental Conservation (of which, the first sheet of three are included in this report).

2.2 CONSTRUCTION RECORDS

No construction records could be located for Glen Creek Dam.

2.3 OPERATION RECORDS

There is no operation of the uncontrolled spillway section. No records have been kept on low level releases.

2.4 EVALUATION OF DATA

The data contained in this report is compiled from information contained in the files of the Department of Environmental Conservation, information from Mr. Robert DeNardo, Park Superintendent and the visual inspection. This information appears to be adequate and reliable for Phase I Inspection purposes.

SECTION 3: VISUAL INSPECTION

3.1 FINDINGS

a. General

Visual inspection of the Glen Creek Dam and watershed was conducted on June 11, 1981. The weather was clear and the temperature ranged in the eighties. The reservoir water surface elevation was 0.1 feet over the primary spillway.

b. Dam

The concrete arch dam appears to be in good condition as it is relatively young. Minor spalling of concrete at the construction joints and areas where the freeze-thaw cycles are affecting the intermittently wetted surfaces (see Photos #3-6) The abutments seem to be solid, however, there is seepage emanating along both abutments at the contact and through the rock. The total amount of seepage is approximately 5-10 gpm from each abutment.

c. Spillway

The overflow spillway was in good condition, with only minor debris accumulated. The same spalling condition exists on the spillway as with the rest of the dam.

d. Reservoir Drain

A single 3 feet by 3 feet sluiceway comprises the reservoir drain. It is a manually operated slide gate and is inoperable at this time.

e. Reservoir

The banks around the reservoir are primarily rock or rock with a thin cover. They appear to be stable. Sedimentation is the purpose of the dam and does not pose a problem at this time.

3.2 EVALUATION OF OBSERVATIONS

The only deficiencies that could be found with the visual inspection was the small amount of concrete deterioration in the areas aforementioned and the inoperable reservoir drain.

SECTION 4: OPERATION AND MAINTENANCE PROCEDURES

4.1 PROCEDURES

The normal water surface is approximated by the uncontrolled overflow primary spillway. All flows into the reservoir are passed over this spillway. The reservoir drain has not been operated in the recent past because it was felt the stem may fail.

4.2 MAINTENANCE OF THE DAM

The dam is maintained by the Finger Lakes State Park and Recreation Commission. Any information regarding maintenance of the dam can be obtained from Mr. Robert DeNardo, Park Superintendent, Watkins Glen State Park, Watkins Glen, New York. (607) 535-4511.

4.3 WARNING SYSTEM

There is no warning system in effect at the present time.

4.4 EVALUATION

The dam has been maintained in a satisfactory condition, except for the minor concrete deterioration and the inoperable reservoir drain.

SECTION 5: HYDROLOGIC/HYDRAULIC

5.1 DRAINAGE AREA CHARACTERISTICS

Glen Creek Dam, as the name implies, is located on Glen Creek about 3½ miles south west of the Village of Watkins Glen in the Town of Dix, Schuyler County, New York. The total drainage area of the contributing basin is 18.51 square miles. The reservoir surface area at normal pool is 8.7 acres. The basin drains generally in an easterly direction. Some areas of the basin are wooded. However, with slopes ranging from moderate to steep, the basin is fairly well drained and was analyzed as a single basin.

5.2 ANALYSIS CRITERIA

The analysis of the spillway capacity of the dam and storage of the reservoir was performed using the Corps of Engineers HEC-1 computer program incorporating the "Snyder Synthetic Unit Hydrograph" method and the "Modified Puls" flood routing procedure. The floods selected for analysis were the PMF and 1/2 the PMF in accordance with the recommended guidelines of the Corps of Engineers.

5.3 SPILLWAY CAPACITY

The spillway has a capacity of 7921 cfs at top of dam. This capacity will be adequate to handle an inflow of 7943 cfs generated by a storm equal to about 30% of the PMF. An inflow of 13,080 cfs generated by a storm equal to 1/2 the PMF will produce a maximum outflow of 13,033 cfs. An inflow of 26,160 cfs resulting from the PMF will produce a maximum outflow of 26,087 cfs.

5.4 RESERVOIR CAPACITY

The reservoir capacity to normal pool elevation is 172 acre-feet. Surcharge storage to top of dam is an additional 137 acre-feet, creating a total storage of 309 acre-feet. The surcharge storage between the spillway crest and the dam crest is equivalent to 0.14 inches of runoff.

5.5 FLOODS OF RECORD

No record of historical flooding in Glen Creek is available.

5.6 OVERTOPPING POTENTIAL

The PMF analysis indicates that the dam will be overtopped by all inflows exceeding 30% of the PMF. A storm equal in magnitude to 1/2 the PMF will overtop the dam by about 2.1 feet. A storm equal to the PMF is expected to overtop the dam by about 6.8 feet.

5.7 EVALUATION

The spillway can only discharge 30% of the PMF before overtopping. However, overtopping of the abutments in this case, of a concrete arch dam is not likely to cause failure of the dam. Therefore, the spillway is assessed as "inadequate".

SECTION 6: STRUCTURAL STABILITY

6.1 EVALUATION OF STRUCTURAL STABILITY

a. Visual Observation

The concrete arch dam appears to be stable. No major cracking or other signs of movement could be found.

b. Design and Construction Data

No information regarding the structural stability of the dam could be located.

c. Operating Records

There is no operation necessary for the Glen Creek Dam. Any records of drain openings could be obtained at the Watkins Glen State Park Office.

d. Post Construction Changes

No changes have been made to the structure since the initial construction

6. SEISMIC STABILITY

No stability analysis was performed on this structure as it is beyond the scope of this report. Glen Creek Dam is located in Seismic Zone 1 and no seismic analysis was performed.

SECTION 7: ASSESSMENT/RECOMMENDATIONS

7.1 ASSESSMENT

a. Safety

The Phase I Inspection of Glen Creek Dam, did not reveal conditions which constitute an immediate hazard to human life or property. The dam is considered to be stable and in relatively good condition. However, the dam has several areas which will require remedial attention.

b. Adequacy of Information

The information available from the Department of Environmental Conservation, Finger Lakes Park Commission, and visual inspection is considered adequate for the Phase I Inspection Report.

c. Need for Additional Investigation

No additional investigations are required at this time.

d. Urgency

The areas requiring remedial action should be initiated within six months and completed within 1 year of notification to the owner.

7.2 RECOMMENDED MEASURES

1. Repair deteriorated concrete on the crest, the downstream slope, around the low level outlet and construction joints.

2. Repair the reservoir drain to working order.

3. Provide a program of periodic inspection and maintenance of the dam, including yearly operation and lubrication of the low level outlet. Document this information for future reference.

4. Develop an emergency action plan for the notification of downstream inhabitants and maintain it during the life of the dam.

APPENDIX A

PHOTOGRAPHS

PHOTO # 2 OVERVIEW - FROM RIGHT ABUTMENT

PHOTO # 3 SPALLING OF CONCRETE
ON CREST OF SECONDARY SPILLWAY

PHOTO #4 SPALLING CONCRETE ON
PRIMARY SPILLWAY WALL

PHOTO #5 MINOR DETERIORATION ON FACE OF DAM

PHOTO #6 MINOR DETERIORATION OF CONCRETE
AROUND CONSTRUCTION JOINTS

PHOTO #7 EFFLORESCENCE FROM SEEPAGE
ON DOWNSTREAM FACE OF DAM

PHOTO #8 SEEPAGE AT CONTACT AND THROUGH
BEDDING PLANES OF BEDROCK FOUNDATION

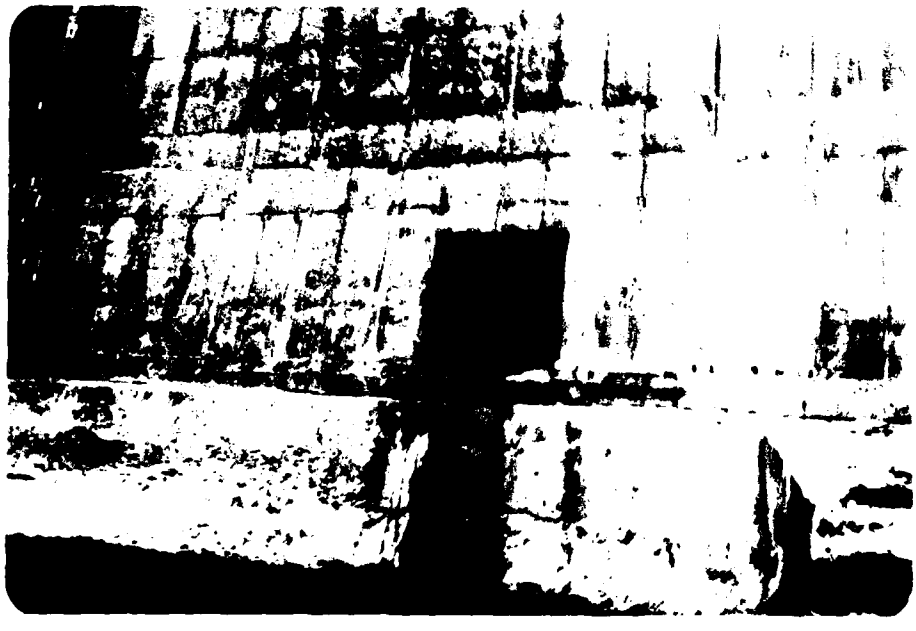


PHOTO # 9 RESERVOIR DRAIN
LOCATED AT LOWER LEFT ABUTMENT

APPENDIX B

VISUAL INSPECTION CHECKLIST

93-15-3(9/80)

VISUAL INSPECTION CHECKLIST

1) Basic Data

a. General

Name of Dam GLEN CREEK DAM

Fed. I.D. # NY 997 DEC Dam No. 60 C-2567

River Basin OSWEGO RIVER BASIN

Location: Town DIX County Schuyler

Stream Name GLEN CREEK

Tributary of SENECA LAKE

Latitude (N) 42° 21.7' Longitude (W) 76° 55.7'

Type of Dam CONCRETE ARCH

Hazard Category HIGH

Date(s) of Inspection JUNE 11, 1981

Weather Conditions clear, 80's

Reservoir Level at Time of Inspection 0.1 ft. OVER SALL. CREST

b. Inspection Personnel KEN HARMER JAMIE VEITCH

c. Persons Contacted (Including Address & Phone No.)

MR ROBERT DENARDO

PARK SUPERINTENDENT, WATKINS GLEN STATE PARK

WATKINS GLEN NY

(607) 535-4511

d. History:

Date Constructed 1957 Date(s) Reconstructed

Designer BOGEMA, GIFFT, JENKINS, Ithaca NY

Constructed By

Owner FINGER LAKES STATE PARK COMMISSION

93-15-3(9/80)

2) Embankment

a. Characteristics

(1) ~~Embankment~~ Material REINFORCED CONCRETE

(2) Cutoff Type NO CUTOFF

(3) Impervious Core N/A

(4) Internal Drainage System NONE

(5) Miscellaneous —

b. Crest

(1) Vertical Alignment GOOD

(2) Horizontal Alignment GOOD

(3) Surface Cracks NONE

(4) Miscellaneous — SPALLING

c. Upstream Slope

(1) Slope (Estimate) (V:H) VERTICAL

(2) Undesirable Growth or Debris, Animal Burrows NONE

(3) Sloughing, Subsidence or Depressions NONE

(4) Slope Protection N/A

(5) Surface Cracks or Movement at Toe NONE

d. Downstream Slope

(1) Slope (Estimate - V:H) VARIES (1H:5V upper) (1H:2.8V lower) See Cross Section

(2) Undesirable Growth or Debris, Animal Burrows None

(3) Sloughing, Subsidence or Depressions NONE

(4) Surface Cracks or Movement at Toe NONE

(5) Seepage SOME AREAS OF seepage AT AND AROUND construction joints

(6) External Drainage System (Ditches, Trenches; Blanket) None,

(7) Condition Around Outlet Structure good

(8) Seepage Beyond Toe SOME THROUGH THE horizontally jointed rock

e. Abutments - Embankment Contact

good - seeping from both abutments apparently NO CHANGE SINCE CONSTRUCTION (INFORMATION FROM R. DeNardo verbally & J. Miller P.E., Senior Park Engr. IN CORRESPONDENCE)

93-15-3(9/80)

(1) Erosion at Contact NO EROSION HOWEVER ROCK IS DETERIORATING

(2) Seepage Along Contact ± 10 gpm from both abutments however this has apparent not changed since construction

3) Drainage System

a. Description of System None

b. Condition of System —

c. Discharge from Drainage System —

4) Instrumentation (Momumentation/Surveys, Observation Wells, Weirs, Piezometers, Etc.)

None

93-15-3(9/80)

5) Reservoir

a. Slopes STABLE, MUCH ROCK,

b. Sedimentation NOT A PROBLEM

c. Unusual Conditions Which Affect Dam NONE

6) Area Downstream of Dam

a. Downstream Hazard (No. of Homes, Highways, etc.) HEAVILY USED CAMP IN DOWNSTREAM CHANNEL, STATE PARK, VILLAGE of WATKINSGLEN

b. Seepage, Unusual Growth SEEPAGE THROUGH ROCK, NO UNUSUAL GROWTH

c. Evidence of Movement Beyond Toe of Dam NONE

d. Condition of Downstream Channel steep gorge

7) Spillway(s) (Including Discharge Conveyance Channel)

a. General broad crested weir overflow section

b. Condition of Service Spillway good, minor spalling of concrete.

c. Condition of Auxiliary Spillway N/A

d. Condition of Discharge Conveyance Channel N/A

8) Reservoir Drain/Outlet

Type: Pipe _____ Conduit _____ Other SLUICEWAY

Material: Concrete ✓ Metal _____ Other _____

Size: 3' x 3' Length 17'

Invert Elevations: Entrance 1014.0 Exit 1014.0

Physical Condition (Describe): minor spalling Unobservable _____

Material: concrete

Joints: N/A Alignment —

Structural Integrity: APPARENTLY GOOD

Hydraulic Capability: 295 cfs AT NORMAL POOL

Means of Control: Gate ✓ Valve _____ Uncontrolled _____

Operation: Operable _____ Inoperable ✓ Other _____

Present Condition (Describe): STEM deteriorated would probably fail if moved

9) Structural

a. Concrete Surfaces Spalling on crest & wetted surfaces

b. Structural Cracking None

c. Movement - Horizontal & Vertical Alignment (Settlement) None

d. Junctions with Abutments or Embankments good - seepage

e. Drains - Foundation, Joint, Face None

f. Water Passages, Conduits, Sluices drain gate inoperable

g. Seepage or Leakage 5-10 gpm from both abutments— no change since construction

h. Joints - Construction, etc. good - minor deterioration around joints

i. Foundation apparently good

j. Abutments good - seepage

k. Control Gates 3 x 3 ft. res. drain inoperable

l. Approach & Outlet Channels N/A

m. Energy Dissipators (Plunge Pool, etc.) good 7 feet deep in bedrock - width of spillway

n. Intake Structures N/A

o. Stability apparently stable

p. Miscellaneous —

10) Appurtenant Structures (Power House, Lock, Gatehouse, Other)

a. Description and Condition N/A

11) Operation Procedures (Lake Level Regulation):

NONE

APPENDIX C

HYDROLOGIC/HYDRAULIC

ENGINEERING DATA AND COMPUTATIONS

CHECK LIST FOR DAMS
HYDROLOGIC AND HYDRAULIC
ENGINEERING DATA

AREA-CAPACITY DATA:

	Elevation (ft.)	Surface Area (acres)	Storage Capacity (acre-ft.)
1) Top of Dam	1070	22.77	309
2) Design High Water (Max. Design Pool)	–	–	–
3) Auxiliary Spillway Crest	–	–	–
4) Pool Level with Flashboards	–	–	–
5) Service Spillway Crest	1061	8.70	172

DISCHARGES

	Volume (cfs)
1) Average Daily	–
2) Spillway @ Maximum High Water	7921
3) Spillway @ Design High Water	–
4) Spillway @ Auxiliary Spillway Crest Elevation	–
5) Low Level Outlet	39
6) Total (of all facilities) @ Maximum High Water	7960
7) Maximum Known Flood	–
8) At Time of Inspection	

CREST: ELEVATION: 1070

Type: Broad-crested, concrete.

Width: 4'-0" Length: 51'-6"

Spillover —

Location —

SPILLWAY:

SERVICE		AUXILIARY
1061	Elevation	None
Broad-crested, Concrete	Type	—
136'-0"	Width	—
	Type of Control	
✓	Uncontrolled	—
	Controlled:	
—	Type (Flashboards; gate)	—
—	Number	—
—	Size/Length	—
	Invert Material	—
	Anticipated Length of operating service	—
—	Chute Length	—
48'	Height Between Spillway Crest & Approach Channel Invert (Weir Flow)	—

HYDROMETEROLOGICAL GAGES:

Type : None

Location: —

Records:

Date - —

Max. Reading - —

FLOOD WATER CONTROL SYSTEM:

Warning System: _____

_____

Method of Controlled Releases (mechanisms):

_____

_____

DRAINAGE AREA: 18.51 Sq. mi

DRAINAGE BASIN RUNOFF CHARACTERISTICS:

Land Use - Type: Open field, Some woods, little residential devel.

Terrain - Relief: Single basin, moderate to steep slopes, imperfectly drained

Surface - Soil: Medium to coarse-textured Acid soils on glacial till

Runoff Potential (existing or planned extensive alterations to existing (surface or subsurface conditions)

No alterations Planned or anticipated

Potential Sedimentation problem areas (natural or man-made; present or future)

Potential Backwater problem areas for levels at maximum storage capacity including surcharge storage:

Dikes - Floodwalls (overflow & non-overflow) - Low reaches along the Reservoir perimeter:

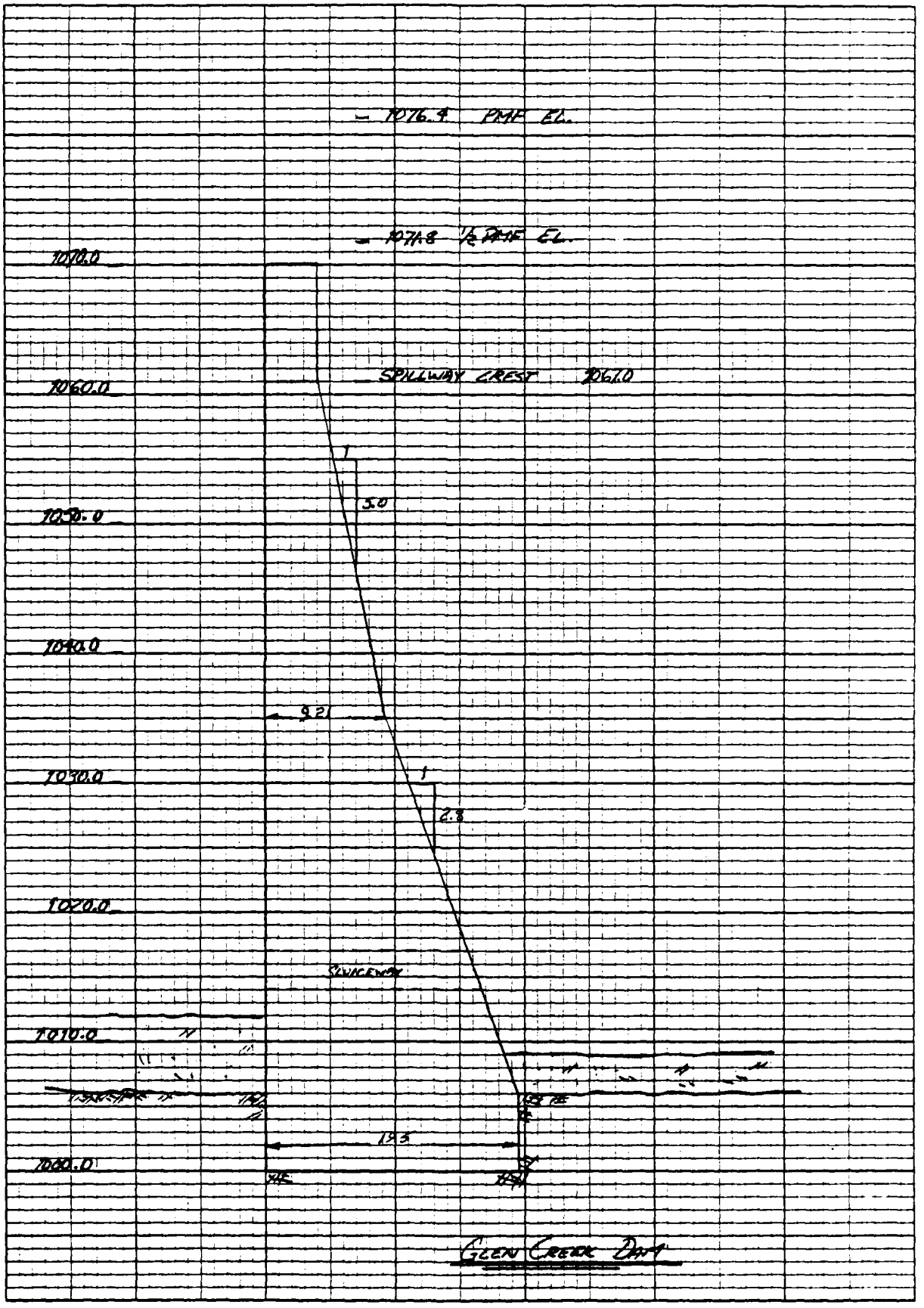
Location:

Elevation:

Reservoir:

Length @ Maximum Pool 0.30 (Miles)

Length of Shoreline (@ Spillway Crest) 0.65 (Miles)



Glen Creek Lake

Drainage area $= (36.80 + 27.42 + 21.74 + 20.83 + 22.23) \times 24{,}000 \times 24{,}000 \times \frac{1}{144} \times \frac{1}{5280 \times 5280}$

$= \frac{129.02 \times 24000 \times 24000}{144 \times 5280 \times 5280}$

$= 18.51 \text{ mi}^2$

$= 11{,}848 \text{ acres}$

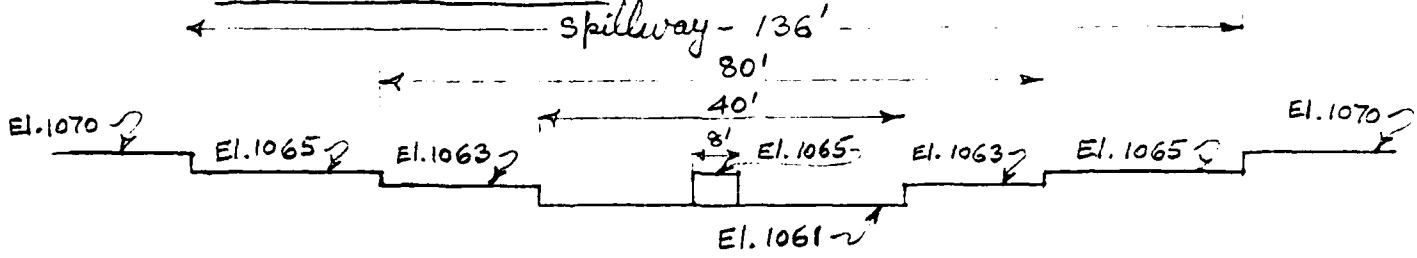
Spillway Crest elev. = 1061
Dam " " = 1070
creek bottom elev. @ spillway = 1012

[From plans dated May 1957]

Elev. vs. Lake Surface Area

Elev.	Surface Area (acres)	
1012	0	
1050	6.85	
1061	8.70	→ [Lake area @ Normal Pool]
1070	22.77	
1100	45.91	

Glen Creek Lake



Spillway Capacity

EL	H_1	L_1	C_1	Q_1	H_2	L_2	C_2	Q_2	H_3	L_3	C_3	Q_3	Total Q
1061	0			0									0
1062	1	32	2.7	86.4									86
1063	2	32	2.7	244									244
1064	3	32	2.7	449	1	40	2.7	108					557
1065	4	32	2.8	717	2	40	2.7	306					1023
1066	5	32	3.1	1109	3	40	2.7	561	1	64	2.7	173	1843
1067	6	32	3.3	1552	4	40	2.8	896	2	64	2.7	489	2937
1068	7	32	3.5	2074	5	40	3.1	1386	3	64	2.7	898	4358
1069	8	32	3.5	2534	6	40	3.3	1940	4	64	2.8	1434	5908
1070	9	32	3.6	3110	7	40	3.5	2593	5	64	3.1	2218	7921
1075	14	32	3.6	6035	12	40	3.6	5986	10	64	3.6	7286	19307

Drainage Area = 18.51 mi^2

Precipitation: $\leq$ PMP = 20.9" (H.M. No. 33)

DUR.	6	12	24	48
%	105	117	127	136

Glen Creek Lake

$$L = \frac{16.8 \times 24{,}000}{12 \times 5280} = 6.36 \text{ mi.}$$

$$Lca = \frac{6.7 \times 24{,}000}{12 \times 5280} = 2.54 \text{ mi.}$$

Assume $C_t = 2.0$ $C_p = 0.625$

$$t_p = C_t (L \times Lca)^{0.3}$$

$$= 2 (6.36 \times 2.54)^{0.3} = 4.61 \text{ hr.}$$

$$t_r = \frac{t_p}{5.5} = \frac{4.61}{5.5} = 0.84 \text{ hr}$$

$$= 50 \text{ mins.} \quad \text{Use } \overset{60}{\textcircled{45}} \text{ mins}$$

$$T_p = t_p + 0.25 (t_R - t_r)$$

$$= 4.61 + 0.25 (0.75 - 0.84)$$

$$= 4.61 - 0.25 \times 0.09$$

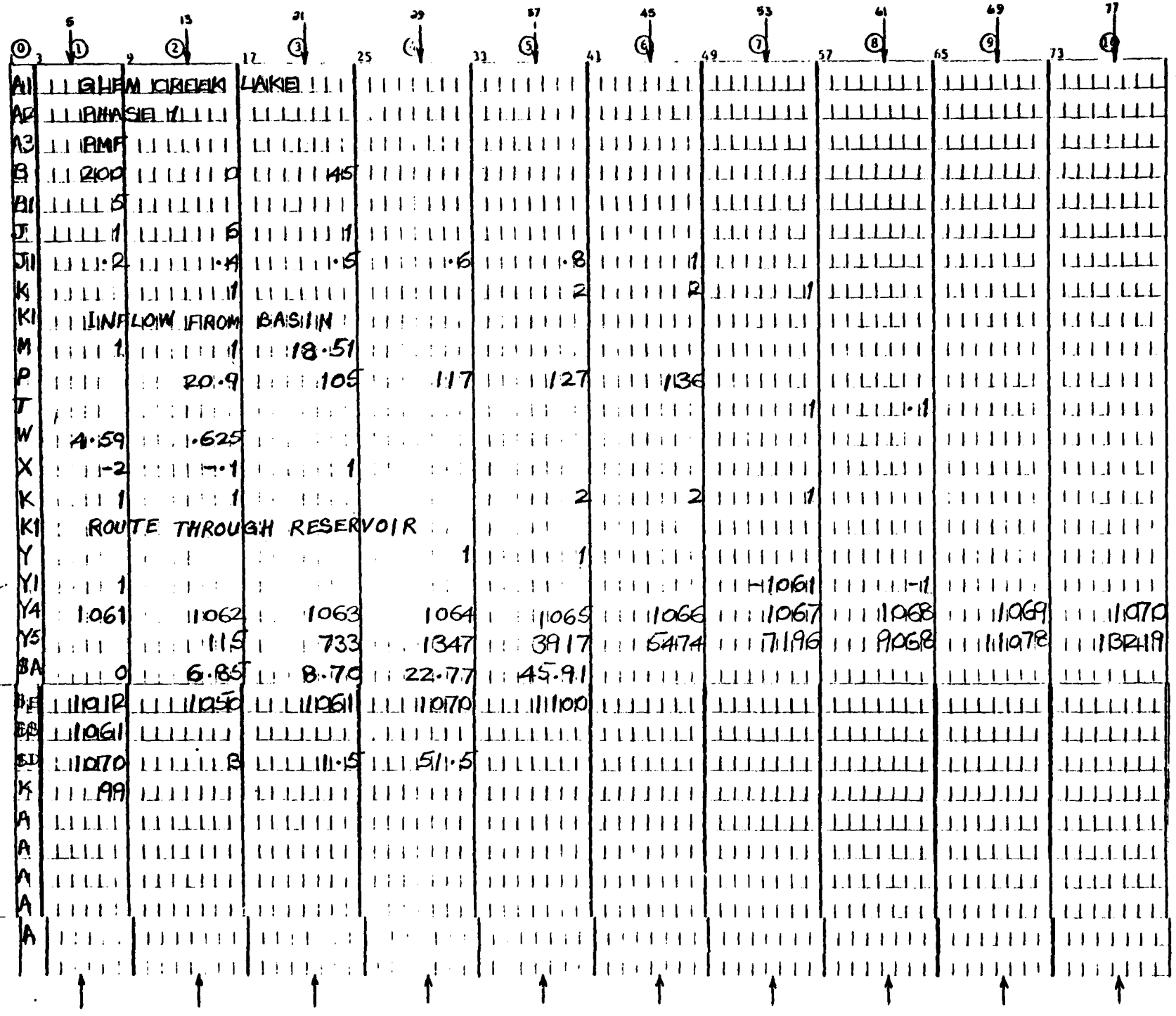
$$= 4.61 - 0.02$$

$$= 4.59 \text{ hr.}$$

Outlet sluice (36"x36". invert elev. → 1014.0) A = 9 sf

Q at max. high water (elev. 1070) $= Ca\sqrt{2gh}$

$= (0.65)(9)\sqrt{64.4 \times 54.5} = 346.6$ cfs


A1 GLEN CREEK LAKE
A2 PHASE 1
A3 PMF
B 2100 145
B1 5
J 1 5 11
J1 1.2 1.4 1.5 1.6 1.8
K 1 2 2
K1 INFLOW FROM BASIN
M 1 1 18.51
P 20.9 105 117 127 136
T 1 1.1
W 4.59 1.625
X -2 -.1 1
K 1 1 2 2 1
K1 ROUTE THROUGH RESERVOIR
Y 1 1
Y1 1 1061 1
Y4 1061 1062 1063 1064 1065 1066 1067 1068 1069 1070
Y5 115 733 1347 3917 5474 7196 9068 11078 13219
BA 0 6.85 8.70 22.77 45.91
PE 1191R 1250 1961 1970 1100
EP 1961
ED 1970 8 111.5 511.5
K 99
A
A
A
A
A

```
**********
FLOOD HYDROGRAPH PACKAGE (HEC-1)
DAM SAFETY VERSION      JULY 1978
  LAST MODIFICATION  26 FEB 79
  MODIFIED FOR HONEYWELL APR 79
**********
```

Glen Creek (F)

```
**********
NEW YORK STATE
DEPT OF ENVIRONMENTAL CONSERVATION
FLOOD PROTECTION BUREAU
**********
```

```
    1          A1   GLEN CREEK LAKE
    2          A2   PHASE 1
    3          A3   PMF
    4          B    200        0      60       0       0       0       0       0       0       0
    5          B1     5
    6          J      1        6       1
    7          J1    .2       .4      .5      .6      .8       1
    8          K                1                       2       2       1
    9          K1   INFLOW FROM BASIN
   10          M      1        1   19.51
   11          P             21.9     105     117     127     136
   12          T                                                       1      .1
   13          W   4.59     .625
   14          X     -2       -.1       3
   15          K      1        1                       2       2       1
   16          K1   ROUTE THROUGH RESERVOIR
   17          Y                                1       1
   18          Y1     1                                        -1061      -1
   19          Y4  1061     1062    1063    1064    1065    1066    1068    1070    1075
   20          Y5             86     244     557    1023    1843    4358    7921   19307
   21          SA      0     6.85    8.70   22.77   45.91
   22          SE   1012     1050    1061    1070    1100
   23          SS   1061
   24          SD   1070        3     1.5    51.5
   25          K      99
   26          A
   27          A
   28          A
   29          A
   30          A
```

PREVIEW OF SEQUENCE OF STREAM NETWORK CALCULATIONS

RUNOFF HYDROGRAPH AT	1
ROUTE HYDROGRAPH TO	1

END OF NETWORK

```
**********                                          **********
FLOOD HYDROGRAPH PACKAGE (HEC-1)                    NEW YORK STATE
DAM SAFETY VERSION      JULY 1978                   DEPT OF ENVIRONMENTAL CONSERVATION
  LAST MODIFICATION  26 FEB 79                      FLOOD PROTECTION BUREAU
  MODIFIED FOR HONEYWELL APR 79
**********                                          **********

RUN  DATE 08/12/81
                    GLEN CREEK LAKE
                    PHASE 1
                    PMF

                                JOB SPECIFICATION
      NO      NHR     NMIN     IDAY      IHR     IMIN    METRC     IPLT     IPRT    NSTAN
     200       0       60        0        0        0        0        0        0        0
                              JOPER      NWT    LROPT    TRACE
                                  5        0        0        0


                        MULTI-PLAN ANALYSES TO BE PERFORMED
                            NPLAN= 1 NRTIO= 6 LRTIO= 1
          RTIOS=   0.20   0.40   0.50   0.60   0.80   1.00

**********          **********          **********          **********          **********

                                SUB-AREA RUNOFF COMPUTATION

                 INFLOW FROM BASIN
                          ISTAG   ICOMP   IECON   ITAPE    JPLT    JPRT   INAME  ISTAGE   IAUTO
                              1       0       0       0       2       2       1       0       0

                                HYDROGRAPH DATA
                IHYDG    IUHG    TAREA    SNAP    TRSDA    TRSPC    RATIO   ISNOW   ISAME   LOCAL
                    1       1    18.51     0.     18.51     0.       0.          0       0       0

                                PRECIP DATA
                          SPFE     PMS      R6      R12      R24      R48      R72      R96
                          0.     21.90   105.00   117.00   127.00   136.00     0.       0.
TRSPC COMPUTED BY THE PROGRAM IS 0.821

                                LOSS DATA
            LROPT   STRKR   DLTKR   RTIOL   ERAIN   STRKS   RTIOK   STRTL   CNSTL   ALSMX   RTIMP
                0     0.      0.     1.00     0.      0.     1.00    1.00    0.10     0.      0.

                            UNIT HYDROGRAPH DATA
                        TP=  4.59     CP=0.63     NTA=  0

                            RECESSION DATA
                        STRTQ=   -2.00     QRCSN=   -0.10     RTIOR= 3.00
APPROXIMATE CLARK COEFFICIENTS FROM GIVEN SNYDER CP AND TP ARE TC= 5.28 AND R= 4.28 INTERVALS

          UNIT HYDROGRAPH 26 END-OF-PERIOD ORDINATES, LAG=   4.61 HOURS, CP= 0.63  VOL= 1.00
        146.     527.    1019.    1433.    1612.    1485.    1156.     946.     748.     551.
        468.     370.     292.     231.     183.     145.     114.      90.      71.      57.
         45.      35.      28.      22.      17.      14.

0                           END-OF-PERIOD FLOW
 MO.DA  HR.MN  PERIOD   RAIN   EXCS   LOSS   COMP Q      MO.DA  HR.MN  PERIOD   RAIN   EXCS   LOSS   COMP Q
 1.01   1.00       1    0.01    0.    0.01      33.       1.05   5.00     161    0.     0.     0.       18.
```

1.01	2.00	2	0.01	0.	0.01	30.	1.05	6.00	102	0.	0.	0.	16.
1.01	3.00	3	0.01	0.	0.01	27.	1.05	7.00	103	0.	0.	0.	14.
1.01	4.00	4	0.01	0.	0.01	24.	1.05	8.00	104	0.	0.	0.	13.
1.01	5.00	5	0.01	0.	0.01	21.	1.05	9.00	105	0.	0.	0.	11.
1.01	6.00	6	0.01	0.	0.01	19.	1.05	10.00	106	0.	0.	0.	10.
1.01	7.00	7	0.03	0.	0.03	17.	1.05	11.00	107	0.	0.	0.	9.
1.01	8.00	8	0.03	0.	0.03	15.	1.05	12.00	108	0.	0.	0.	8.
1.01	9.00	9	0.03	0.	0.03	14.	1.05	13.00	109	0.	0.	0.	7.
1.01	10.00	10	0.03	0.	0.03	12.	1.05	14.00	110	0.	0.	0.	7.
1.01	11.00	11	0.03	0.	0.03	11.	1.05	15.00	111	0.	0.	0.	6.
1.01	12.00	12	0.03	0.	0.03	10.	1.05	16.00	112	0.	0.	0.	5.
1.01	13.00	13	0.13	0.	0.13	9.	1.05	17.00	113	0.	0.	0.	5.
1.01	14.00	14	0.16	0.	0.16	8.	1.05	18.00	114	0.	0.	0.	4.
1.01	15.00	15	0.20	0.	0.20	7.	1.05	19.00	115	0.	0.	0.	4.
1.01	16.00	16	0.51	0.17	0.34	51.	1.05	20.00	116	0.	0.	0.	3.
1.01	17.00	17	0.19	0.09	0.10	106.	1.05	21.00	117	0.	0.	0.	3.
1.01	18.00	18	0.15	0.05	0.10	227.	1.05	22.00	118	0.	0.	0.	3.
1.01	19.00	19	0.01	0.	0.01	356.	1.05	23.00	119	0.	0.	0.	2.
1.01	20.00	20	0.01	0.	0.01	445.	1.06	0.	120	0.	0.	0.	2.
1.01	21.00	21	0.01	0.	0.01	458.	1.06	1.00	121	0.	0.	0.	2.
1.01	22.00	22	0.01	0.	0.01	407.	1.06	2.00	122	0.	0.	0.	2.
1.01	23.00	23	0.01	0.	0.01	334.	1.06	3.00	123	0.	0.	0.	2.
1.02	0.	24	0.01	0.	0.01	266.	1.06	4.00	124	0.	0.	0.	1.
1.02	1.00	25	0.12	0.02	0.10	213.	1.06	5.00	125	0.	0.	0.	1.
1.02	2.00	26	0.12	0.02	0.10	180.	1.06	6.00	126	0.	0.	0.	1.
1.02	3.00	27	0.12	0.02	0.10	165.	1.06	7.00	127	0.	0.	0.	1.
1.02	4.00	28	0.12	0.02	0.10	166.	1.06	8.00	128	0.	0.	0.	1.
1.02	5.00	29	0.12	0.02	0.10	177.	1.06	9.00	129	0.	0.	0.	1.
1.02	6.00	30	0.12	0.02	0.10	189.	1.06	10.00	130	0.	0.	0.	1.
1.02	7.00	31	0.36	0.26	0.10	234.	1.06	11.00	131	0.	0.	0.	1.
1.02	8.00	32	0.36	0.26	0.10	368.	1.06	12.00	132	0.	0.	0.	1.
1.02	9.00	33	0.36	0.26	0.10	619.	1.06	13.00	133	0.	0.	0.	1.
1.02	10.00	34	0.36	0.26	0.10	967.	1.06	14.00	134	0.	0.	0.	0.
1.02	11.00	35	0.36	0.26	0.10	1357.	1.06	15.00	135	0.	0.	0.	0.
1.02	12.00	36	0.36	0.26	0.10	1717.	1.06	16.00	136	0.	0.	0.	0.
1.02	13.00	37	1.89	1.79	0.10	2228.	1.06	17.00	137	0.	0.	0.	0.
1.02	14.00	38	2.26	2.16	0.10	3317.	1.06	18.00	138	0.	0.	0.	0.
1.02	15.00	39	2.83	2.73	0.10	5337.	1.06	19.00	139	0.	0.	0.	0.
1.02	16.00	40	7.17	7.07	0.10	8984.	1.06	20.00	140	0.	0.	0.	0.
1.02	17.00	41	2.64	2.54	0.10	14306.	1.06	21.00	141	0.	0.	0.	0.
1.02	18.00	42	2.08	1.98	0.10	20037.	1.06	22.00	142	0.	0.	0.	0.
1.02	19.00	43	0.18	0.08	0.10	24434.	1.06	23.00	143	0.	0.	0.	0.
1.02	20.00	44	0.18	0.08	0.10	26160.	1.07	0.	144	0.	0.	0.	0.
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1.02	22.00	46	0.18	0.08	0.10	21372.	1.07	2.00	146	0.	0.	0.	0.
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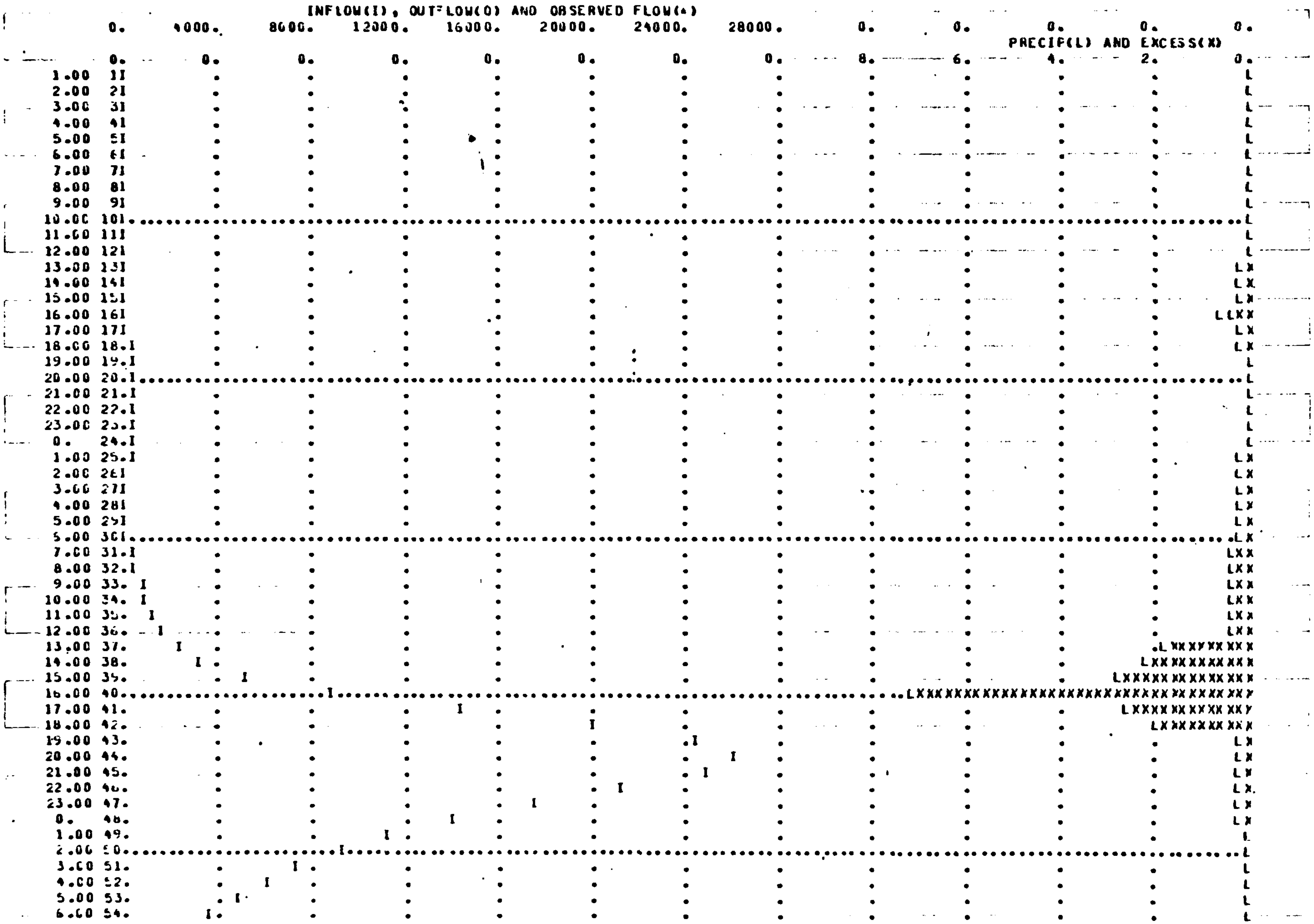
1.03	4.00	52	0.	0.	0.	5850.	1.07	8.00	152	0.	0.	0.	0.
1.03	5.00	53	0.	0.	0.	4645.	1.07	9.00	153	0.	0.	0.	0.
1.03	6.00	54	0.	0.	0.	3674.	1.07	10.00	154	0.	0.	0.	0.
1.03	7.00	55	0.	0.	0.	2905.	1.07	11.00	155	0.	0.	0.	0.
1.03	8.00	56	0.	0.	0.	2473.	1.07	12.00	156	0.	0.	0.	0.
1.03	9.00	57	0.	0.	0.	2216.	1.07	13.00	157	0.	0.	0.	0.
1.03	10.00	58	0.	0.	0.	1985.	1.07	14.00	158	0.	0.	0.	0.
1.03	11.00	59	0.	0.	0.	1779.	1.07	15.00	159	0.	0.	0.	0.
1.03	12.00	60	0.	0.	0.	1594.	1.07	16.00	160	0.	0.	0.	0.
1.03	13.00	61	0.	0.	0.	1428.	1.07	17.00	161	0.	0.	0.	0.
1.03	14.00	62	0.	0.	0.	1279.	1.07	18.00	162	0.	0.	0.	0.

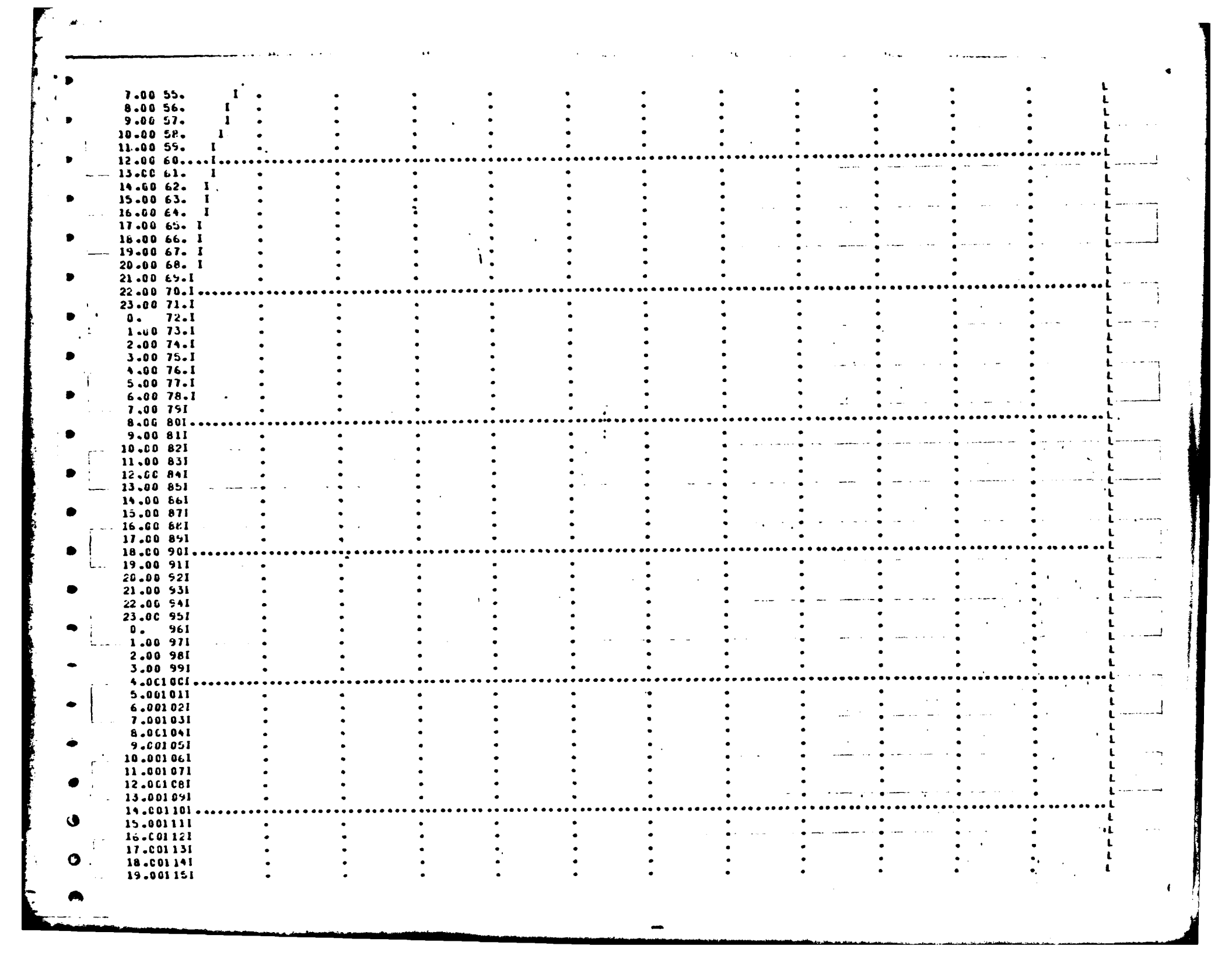
1.03	15.00	63	0.	0.	0.	1146.	1.07	19.00	163	0.	0.	0.	0.
1.03	16.00	64	0.	0.	0.	1027.	1.07	20.00	164	0.	0.	0.	0.
1.03	17.00	65	0.	0.	0.	920.	1.07	21.00	165	0.	0.	0.	0.
1.03	18.00	66	0.	0.	0.	824.	1.07	22.00	166	0.	0.	0.	0.
1.03	19.00	67	0.	0.	0.	739.	1.07	23.00	167	0.	0.	0.	0.
1.03	20.00	68	0.	0.	0.	662.	1.08	0.	168	0.	0.	0.	0.
1.03	21.00	69	0.	0.	0.	593.	1.08	1.00	169	0.	0.	0.	0.
1.03	22.00	70	0.	0.	0.	531.	1.08	2.00	170	0.	0.	0.	0.
1.03	23.00	71	0.	0.	0.	476.	1.08	3.00	171	0.	0.	0.	0.
1.04	0.	72	0.	0.	0.	426.	1.08	4.00	172	0.	0.	0.	0.
1.04	1.00	73	0.	0.	0.	382.	1.08	5.00	173	0.	0.	0.	0.
1.04	2.00	74	0.	0.	0.	342.	1.08	6.00	174	0.	0.	0.	0.
1.04	3.00	75	0.	0.	0.	307.	1.08	7.00	175	0.	0.	0.	0.
1.04	4.00	76	0.	0.	0.	275.	1.08	8.00	176	0.	0.	0.	0.
1.04	5.00	77	0.	0.	0.	246.	1.08	9.00	177	0.	0.	0.	0.
1.04	6.00	78	0.	0.	0.	221.	1.08	10.00	178	0.	0.	0.	0.
1.04	7.00	79	0.	0.	0.	198.	1.08	11.00	179	0.	0.	0.	0.
1.04	8.00	80	0.	0.	0.	177.	1.08	12.00	180	0.	0.	0.	0.
1.04	9.00	81	0.	0.	0.	159.	1.08	13.00	181	0.	0.	0.	0.
1.04	10.00	82	0.	0.	0.	142.	1.08	14.00	182	0.	0.	0.	0.
1.04	11.00	83	0.	0.	0.	127.	1.08	15.00	183	0.	0.	0.	0.
1.04	12.00	84	0.	0.	0.	114.	1.08	16.00	184	0.	0.	0.	0.
1.04	13.00	85	0.	0.	0.	102.	1.08	17.00	185	0.	0.	0.	0.
1.04	14.00	86	0.	0.	0.	92.	1.08	18.00	186	0.	0.	0.	0.
1.04	15.00	87	0.	0.	0.	82.	1.08	19.00	187	0.	0.	0.	0.
1.04	16.00	88	0.	0.	0.	74.	1.08	20.00	188	0.	0.	0.	0.
1.04	17.00	89	0.	0.	0.	66.	1.08	21.00	189	0.	0.	0.	0.
1.04	18.00	90	0.	0.	0.	59.	1.08	22.00	190	0.	0.	0.	0.
1.04	19.00	91	0.	0.	0.	53.	1.08	23.00	191	0.	0.	0.	0.
1.04	20.00	92	0.	0.	0.	47.	1.09	0.	192	0.	0.	0.	0.
1.04	21.00	93	0.	0.	0.	42.	1.09	1.00	193	0.	0.	0.	0.
1.04	22.00	94	0.	0.	0.	38.	1.09	2.00	194	0.	0.	0.	0.
1.04	23.00	95	0.	0.	0.	34.	1.09	3.00	195	0.	0.	0.	0.
1.05	0.	96	0.	0.	0.	31.	1.09	4.00	196	0.	0.	0.	0.
1.05	1.00	97	0.	0.	0.	27.	1.09	5.00	197	0.	0.	0.	0.
1.05	2.00	98	0.	0.	0.	25.	1.09	6.00	198	0.	0.	0.	0.
1.05	3.00	99	0.	0.	0.	22.	1.09	7.00	199	0.	0.	0.	0.
1.05	4.00	100	0.	0.	0.	20.	1.09	8.00	200	0.	0.	0.	0.
									SUM	24.44	20.72	3.72	260517.
										(621.)	(526.)	(94.)	(7377.(2)

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	26160.	22119.	9901.	3605.	260507.
CMS	741.	626.	280.	102.	7377.
INCHES		11.12	19.90	21.74	21.82
MM		282.35	505.53	552.26	554.23
AC-FT		10968.	19638.	21453.	21530.
THOUS CU M		13529.	24223.	26462.	26556.

STATION 1



INFLOW(I), OUTFLOW(O) AND OBSERVED FLOW(*)
0. 4000. 8000. 12000. 16000. 20000. 24000. 28000.
PRECIP(L) AND EXCESS(X)
8. 6. 4. 2. 0.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15.00 63. I
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18.00 66. I
19.00 67. I
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22.00 70. I
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0. 72. I
1.00 73. I
2.00 74. I
3.00 75. I
4.00 76. I
5.00 77. I
6.00 78. I
7.00 79 I
8.00 80 I
9.00 81 I
10.00 82 I
11.00 83 I
12.00 84 I
13.00 85 I
14.00 86 I
15.00 87 I
16.00 88 I
17.00 89 I
18.00 90 I
19.00 91 I
20.00 92 I
21.00 93 I
22.00 94 I
23.00 95 I
0. 96 I
1.00 97 I
2.00 98 I
3.00 99 I
4.001 00 I
5.001 01 I
6.001 02 I
7.001 03 I
8.001 04 I
9.001 05 I
10.001 06 I
11.001 07 I
12.001 08 I
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14.001 10 I
15.001 11 I
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17.001 13 I
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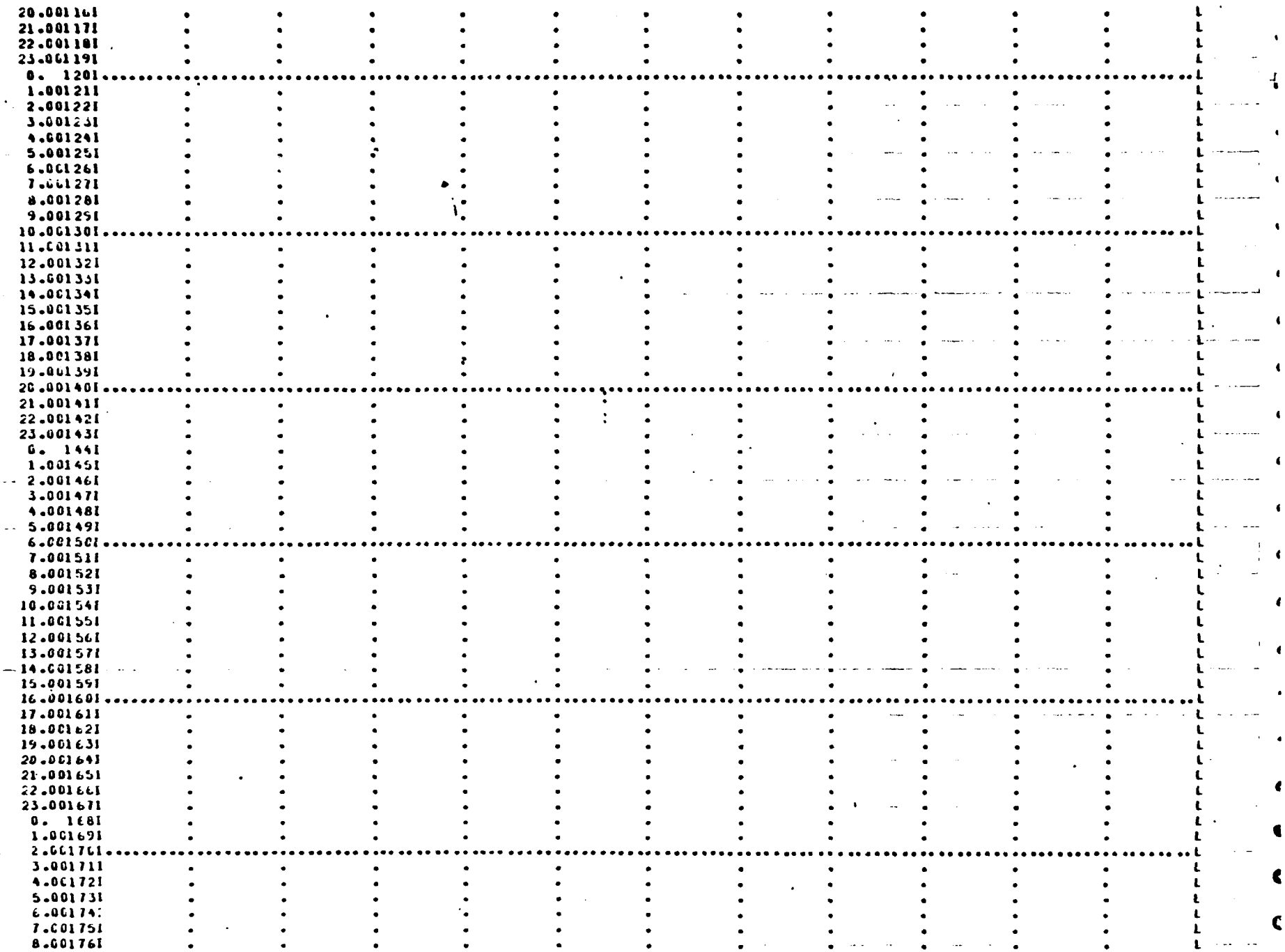
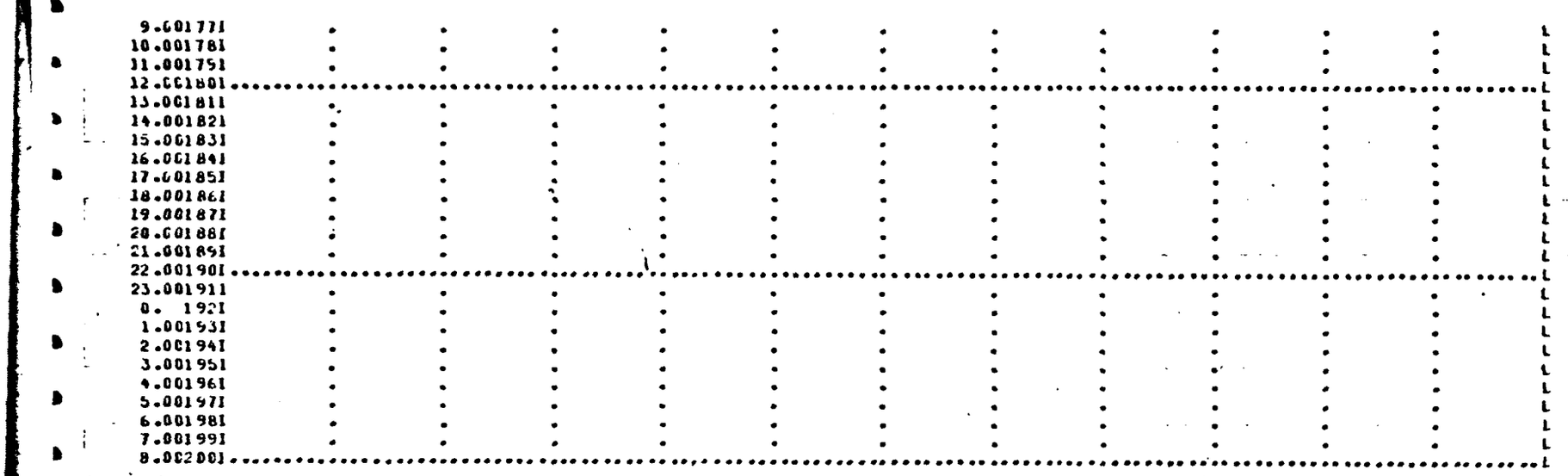
19.001 15 I

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23.001911
0. 1921
1.001931
2.001941
3.001951
4.001961
5.001971
6.001981
7.001991
8.002001

•DVN•

HYDROGRAPH AT STA 1 FOR PLAN 1, RTIO 1

7.	6.	5.	5.	4.	4.	3.	3.	3.	2.
2.	2.	2.	2.	1.	6.	21.	45.	71.	89.
92.	81.	67.	53.	43.	36.	33.	33.	35.	38.
47.	74.	124.	193.	271.	343.	446.	653.	1067.	1757.
2861.	4007.	4887.	5232.	4956.	4274.	3510.	2824.	2270.	1826.
1465.	1170.	929.	735.	581.	495.	443.	397.	356.	319.
286.	256.	225.	205.	184.	165.	148.	132.	119.	106.
95.	85.	76.	68.	61.	55.	49.	44.	40.	35.
32.	28.	25.	23.	20.	18.	16.	15.	13.	12.
11.	5.	8.	8.	7.	6.	5.	5.	4.	4.
4.	3.	3.	3.	2.	2.	2.	2.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	5232.	4424.	1980.	721.	52101.
CMS	148.	125.	56.	20.	1475.
INCHES		2.22	3.98	4.35	4.36
MM		56.47	101.11	110.45	110.85
AC-FT		2194.	3928.	4291.	4306.
THOUS CU M		2706.	4845.	5292.	5311.

HYDROGRAPH AT STA 1 FOR PLAN 1, RTIO 2

13.	12.	11.	10.	9.	8.	7.	6.	6.	5.
4.	4.	4.	3.	3.	12.	42.	91.	143.	178.
183.	163.	134.	106.	85.	72.	66.	67.	71.	76.
94.	147.	248.	387.	543.	687.	891.	1327.	2135.	3554.
5723.	8015.	9774.	10464.	9913.	8545.	7020.	5647.	4541.	3652.
2931.	2340.	1858.	1470.	1162.	989.	886.	794.	712.	638.
571.	512.	459.	411.	368.	330.	295.	265.	237.	213.
190.	171.	153.	137.	123.	110.	98.	88.	75.	71.
63.	57.	51.	46.	41.	37.	33.	29.	26.	24.
21.	19.	17.	15.	14.	12.	11.	10.	9.	8.
7.	6.	6.	5.	5.	4.	4.	3.	3.	3.
2.	2.	2.	2.	2.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	10464.	8848.	3960.	1442.	104203.
CMS	296.	251.	112.	41.	2951.
INCHES		4.45	7.96	8.70	8.73
MM		112.94	202.21	220.90	221.69
AC-FT		4387.	7855.	8581.	8612.

THOUS CU M			5412.	5689.	10585.		10623.		

HYDROGRAPH AT STA 1 FOR PLAN 1, RTIO 3

17.	15.	13.	12.	11.	10.	9.	8.	7.	6.
6.	5.	4.	4.	4.	15.	53.	114.	178.	222.
229.	204.	167.	133.	107.	90.	83.	88.	88.	94.
117.	184.	309.	484.	679.	858.	1114.	1659.	2668.	4492.
7153.	10019.	12217.	13080.	12391.	10686.	8775.	7059.	5676.	4566.
3663.	2925.	2322.	1837.	1453.	1237.	1108.	993.	889.	797.
714.	640.	573.	514.	460.	412.	369.	331.	296.	266.
238.	213.	191.	171.	153.	137.	123.	110.	99.	89.
79.	71.	64.	57.	51.	46.	41.	37.	33.	30.
26.	24.	21.	19.	17.	15.	14.	12.	11.	10.
9.	8.	7.	6.	6.	5.	5.	4.	4.	3.
3.	3.	2.	2.	2.	2.	2.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	13080.	11080.	4950.	1803.	130234.
CMS	370.	313.	140.	51.	3688.
INCHES		5.56	9.95	10.87	10.91
MM		141.17	252.77	276.13	277.11
AC-FT		5484.	9819.	10727.	10765.
THOUS CU M		6764.	12112.	13231.	13278.

HYDROGRAPH AT STA 1 FOR PLAN 1, RTIO 4

20.	18.	16.	14.	13.	11.	10.	9.	8.	7.
7.	6.	5.	5.	4.	18.	64.	136.	214.	267.
275.	244.	201.	159.	128.	108.	99.	100.	106.	113.
140.	221.	371.	580.	814.	1030.	1327.	1990.	3202.	5390.
8584.	12022.	14661.	15696.	14869.	12823.	10531.	8471.	6811.	5479.
4396.	3510.	2787.	2205.	1743.	1484.	1330.	1191.	1067.	956.
857.	768.	688.	616.	552.	495.	443.	397.	356.	319.
286.	256.	229.	205.	184.	165.	148.	132.	119.	106.
95.	85.	76.	68.	61.	55.	49.	44.	40.	35.
32.	28.	25.	23.	20.	18.	16.	15.	13.	12.
11.	9.	8.	8.	7.	6.	5.	5.	4.	4.
4.	3.	3.	3.	2.	2.	2.	2.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	15396.	13276.	5940.	2169.	156324.
CMS	436.	376.	168.	61.	4427.
INCHES		6.67	11.94	13.03	13.08
MM		169.41	303.24	330.96	332.24

AC-FT			6561.	11783.	12872.	12918.			
THOUS CU M			8117.	14534.	15877.	15934.			

HYDROGRAPH AT STA 1 FOR PLAN 1, RTIO 5

27.	24.	21.	19.	17.	15.	14.	12.	11.	10.
9.	8.	7.	6.	6.	24.	85.	182.	285.	356.
367.	326.	267.	213.	171.	144.	132.	133.	141.	151.
187.	295.	495.	774.	1086.	1373.	1782.	2654.	4269.	7187.
11445.	16030.	19547.	20928.	19825.	17058.	14041.	11295.	9081.	7305.
5862.	4680.	3716.	2939.	2324.	1979.	1773.	1588.	1423.	1275.
1142.	1024.	917.	828.	736.	660.	591.	529.	474.	425.
381.	341.	306.	274.	245.	220.	197.	176.	158.	142.
127.	114.	102.	91.	82.	73.	66.	59.	53.	47.
42.	38.	34.	30.	27.	24.	22.	20.	18.	16.
14.	13.	11.	10.	9.	8.	7.	7.	6.	5.
5.	4.	4.	3.	3.	3.	2.	2.	2.	2.
2.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	20928.	17695.	7921.	2884.	208406.
CMS	593.	501.	224.	82.	5901.
INCHES		8.89	15.92	17.39	17.46
MM		225.88	404.43	441.81	443.38
AC-FT		8774.	15710.	17162.	17224.
THOUS CU M		10823.	19378.	21170.	21245.

HYDROGRAPH AT STA 1 FOR PLAN 1, RTIO 6

33.	30.	27.	24.	21.	19.	17.	15.	14.	12.
11.	10.	9.	8.	7.	31.	106.	227.	356.	445.
458.	407.	334.	266.	213.	180.	165.	166.	177.	189.
234.	368.	615.	967.	1357.	1717.	2228.	3317.	5337.	8904.
14306.	20037.	24434.	26160.	24782.	21372.	17551.	14118.	11352.	9121.
7327.	5850.	4645.	3674.	2905.	2473.	2216.	1985.	1779.	1594.
1428.	1275.	1146.	1027.	920.	824.	739.	662.	593.	531.
476.	426.	382.	342.	307.	275.	246.	221.	198.	177.
159.	142.	127.	114.	102.	92.	82.	74.	66.	59.
53.	47.	42.	38.	34.	31.	27.	25.	22.	20.
18.	16.	14.	13.	11.	10.	9.	8.	7.	7.
6.	5.	5.	4.	4.	3.	3.	3.	2.	2.
2.	2.	2.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	26160.	22119.	9901.	3605.	260507.
CMS	741.	626.	280.	102.	7377.
INCHES		11.12	19.90	21.74	21.82

MM	282.35	505.53	552.26	554.23
AC-FT	10969.	19638.	21451.	21530.
THOUS CU M	13529.	24223.	26462.	26556.

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HYDROGRAPH ROUTING

ROUTE THROUGH RESERVOIR

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
1	1	0	0	2	2	1	0	0

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPMP	LSTR
0.	0.	0.	1	1	0	0	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA	ISPRAT
1	0	0	0.	0.	0.	-1061.	-1

STAGE	1061.00	1062.00	1063.00	1064.00	1065.00	1066.00	1068.00	1070.00	1075.00
FLOW	0.	86.00	244.00	557.00	1023.00	1843.00	4358.00	7921.00	19307.00
SURFACE AREA=	0.	7.	9.	23.	46.				
CAPACITY=	0.	87.	172.	309.	1319.				
ELEVATION=	1012.	1050.	1061.	1070.	1100.				

CREL	SPWID	COGW	EXPW	ELEVL	COOL	CAREA	EXPL
1061.0	0.	0.	0.	0.	0.	0.	0.

DAM DATA

TOPEL	COQD	EXPD	DAMWID
1070.0	3.0	1.5	52.

STATION 1, PLAN 1, RATIO 1

END-OF-PERIOD HYDROGRAPH ORDINATES

CUTFLOW

4.	5.	5.	5.	5.	4.	4.	4.	3.	3.
3.	2.	2.	2.	2.	3.	9.	23.	43.	63.
78.	82.	78.	68.	57.	47.	40.	36.	35.	36.
39.	51.	77.	136.	209.	295.	359.	559.	922.	1613.
2679.	3805.	4778.	5222.	5021.	4375.	3660.	2923.	2354.	1867.
1551.	1226.	986.	806.	630.	525.	468.	419.	375.	335.
300.	269.	242.	224.	202.	181.	162.	145.	130.	116.
104.	93.	84.	78.	71.	64.	58.	52.	46.	41.
37.	33.	30.	27.	24.	21.	19.	17.	15.	14.
12.	11.	10.	9.	8.	7.	6.	6.	5.	5.
4.	4.	3.	3.	3.	2.	2.	2.	2.	2.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	..	0.	0.	..	0.	0.	..	..	..
..	.	..	..	..	..	..	..	..	..
..	.	..	..	..	..	..	..	..	..

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         0.          0.          0.          0.          0.          0.          0.          0.          0.          0.
         0.          0.          0.          0.          0.          0.          0.          0.          0.          0.

                                                          STORAGE
       172.        173.        173.        173.        173.        173.        172.        172.        172.        172.
       172.        172.        172.        172.        172.        172.        173.        174.        177.        179.
       180.        181.        180.        179.        178.        177.        176.        176.        176.        176.
       176.        177.        180.        185.        190.        194.        158.        204.        214.        228.
       243.        255.        271.        276.        274.        267.        257.        246.        239.        233.
       227.        221.        216.        211.        206.        203.        200.        198.        197.        195.
       194.        193.        192.        191.        189.        188.        186.        185.        184.        183.
       183.        182.        181.        180.        180.        175.        178.        178.        177.        176.
       176.        176.        175.        175.        175.        174.        174.        174.        174.        173.
       173.        173.        173.        173.        173.        173.        173.        173.        173.        173.
       173.        172.        172.        172.        172.        172.        172.        172.        172.        172.
       172.        172.        172.        172.        172.        172.        172.        172.        172.        172.
       172.        172.        172.        172.        172.        172.        172.        172.        172.        172.
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       172.        172.        172.        172.        172.        172.        172.        172.        172.        172.
       172.        172.        172.        172.        172.        172.        172.        172.        172.        172.
       172.        172.        172.        172.        172.        172.        172.        172.        172.        172.
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       172.        172.        172.        172.        172.        172.        172.        172.        172.        172.
       172.        172.        172.        172.        172.        172.        172.        172.        172.        172.

                                                           STAGE
     1061.0      1061.1      1061.1      1061.1      1061.1      1061.1      1061.0      1061.0      1061.0      1061.0
     1061.0      1061.0      1061.0      1061.0      1061.0      1061.0      1061.1      1061.3      1061.5      1061.7
     1061.9      1062.0      1061.9      1061.8      1061.7      1061.6      1061.5      1061.4      1061.4      1061.4
     1061.5      1061.6      1061.5      1062.3      1062.8      1063.2      1063.5      1064.0      1064.8      1065.7
     1066.7      1067.6      1068.2      1068.5      1068.4      1068.0      1067.4      1066.9      1066.4      1066.0
     1065.6      1065.2      1064.5      1064.5      1064.2      1063.9      1063.7      1063.5      1063.4      1063.3
     1063.2      1063.1      1063.0      1062.9      1062.7      1062.6      1062.5      1062.4      1062.3      1062.2
     1062.1      1062.0      1062.0      1061.9      1061.8      1061.7      1061.7      1061.6      1061.5      1061.5
     1061.4      1061.4      1061.3      1061.3      1061.3      1061.2      1061.2      1061.2      1061.2      1061.2
     1061.1      1061.1      1061.1      1061.1      1061.1      1061.1      1061.1      1061.1      1061.1      1061.1
     1061.0      1061.0      1061.0      1061.0      1061.0      1061.0      1061.0      1061.0      1061.0      1061.0
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     1061.0      1061.0      1061.0      1061.0      1061.0      1061.0      1061.0      1061.0      1061.0      1061.0
     1061.0      1061.0      1061.0      1061.0      1061.0      1061.0      1061.0      1061.0      1061.0      1061.0
     1061.0      1061.0      1061.0      1061.0      1061.0      1061.0      1061.0      1061.0      1061.0      1061.0
     1061.0      1061.0      1061.0      1061.0      1061.0      1061.0      1061.0      1061.0      1061.0      1061.0
     1061.0      1061.0      1061.0      1061.0      1061.0      1061.0      1061.0      1061.0      1061.0      1061.0

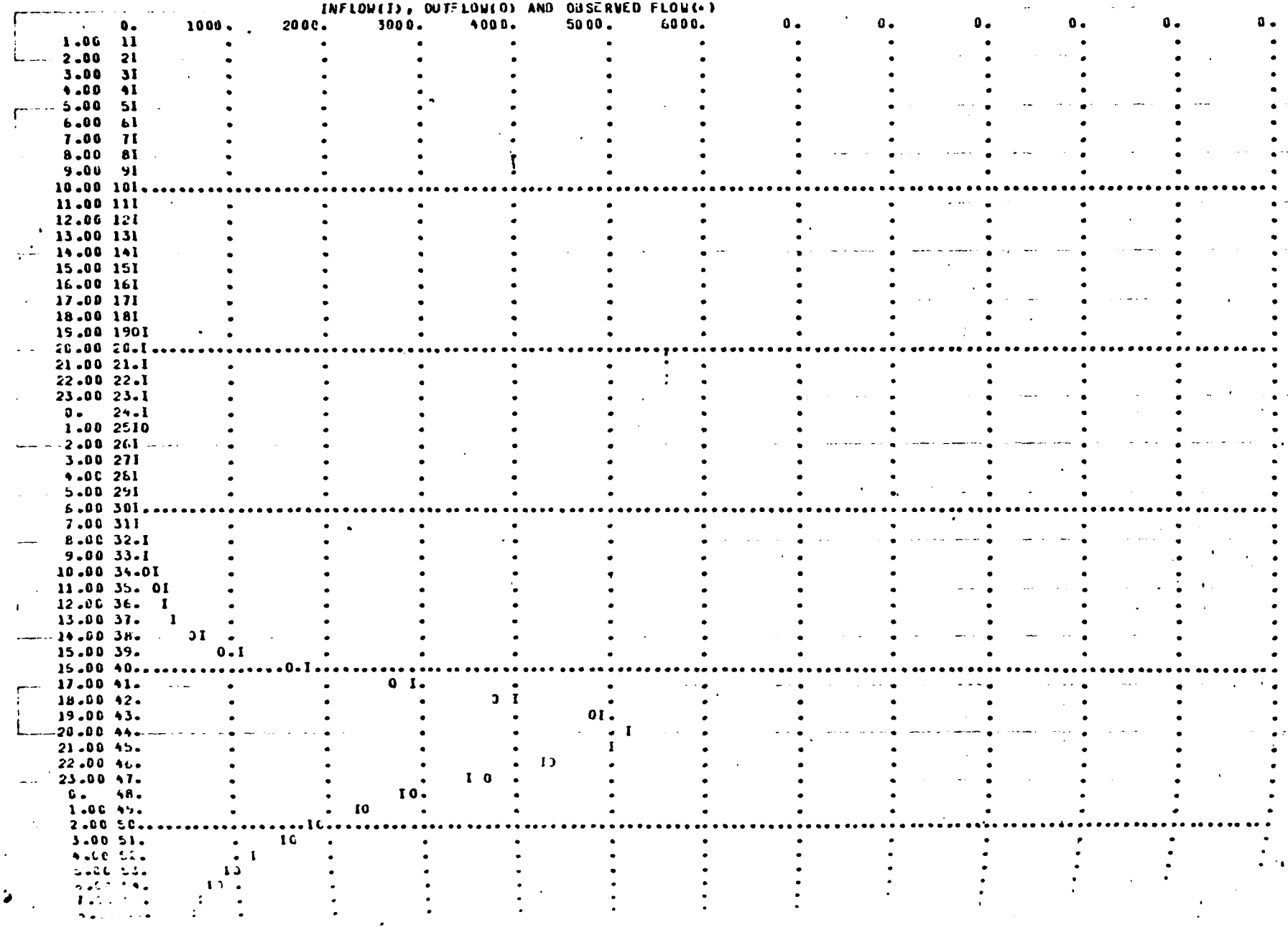
 PEAK OUTFLOW IS      5222. AT TIME  44.00 HOURS

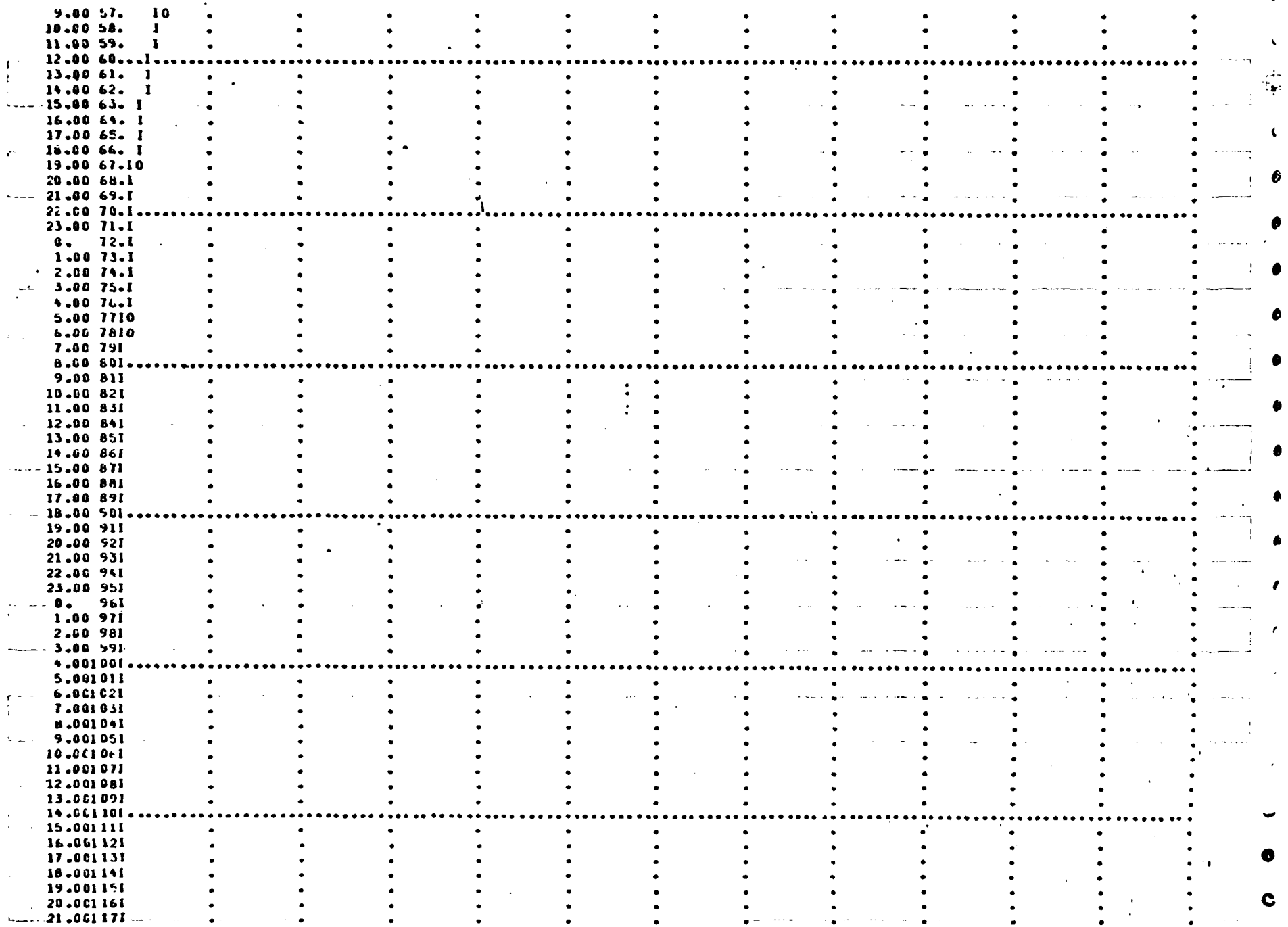
                                   PEAK    6-HOUR    24-HOUR    72-HOUR   TOTAL VOLUME
                           CFS    5222.     4404.      1979.       721.         52107.
                           CMS     148.      125.        56.        20.          1475.
                        INCHES               2.21       3.98       4.35          4.36
                            MM              56.22     101.07     110.44        110.86
                         AC-FT              2184.      3926.      4290.          4306.
                     THOUS CU M             2694.      4843.      5292.          5312.
```

DVF

STATION 1

INFLOW(I), OUTFLOW(O) AND OBSERVED FLOW(*)

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14.00 62. I
15.00 63. I
16.00 64. I
17.00 65. I
18.00 66. I
19.00 67.10
20.00 68.1
21.00 69.I
22.00 70.I
23.00 71.I
0. 72.I
1.00 73.I
2.00 74.I
3.00 75.I
4.00 76.I
5.00 7710
6.00 7810
7.00 79I
8.00 80I
9.00 81I
10.00 82I
11.00 83I
12.00 84I
13.00 85I
14.00 86I
15.00 87I
16.00 88I
17.00 89I
18.00 90I
19.00 91I
20.00 92I
21.00 93I
22.00 94I
23.00 95I
0. 96I
1.00 97I
2.00 98I
3.00 99I
4.001 00I
5.001 01I
6.001 02I
7.001 03I
8.001 04I
9.001 05I
10.001 06I
11.001 07I
12.001 08I
13.001 09I
14.001 10I
15.001 11I
16.001 12I
17.001 13I
18.001 14I
19.001 15I
20.001 16I
21.001 17I


22.001181
23.001191
0. 1201
1.001211
2.001221
3.001231
4.001241
5.001251
6.001261
7.001271
8.001281
9.001291
10.001301
11.001311
12.001321
13.001331
14.001341
15.001351
16.001361
17.001371
18.001381
19.001391
20.001401
21.001411
22.001421
23.001431
0. 1441
1.001451
2.001461
3.001471
4.001481
5.001491
6.001501
7.001511
8.001521
9.001531
10.001541
11.001551
12.001561
13.001571
14.001581
15.001591
16.001601
17.001611
18.001621
19.001631
20.001641
21.001651
22.001661
23.001671
0. 1681
1.001691
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3.001711
4.001721
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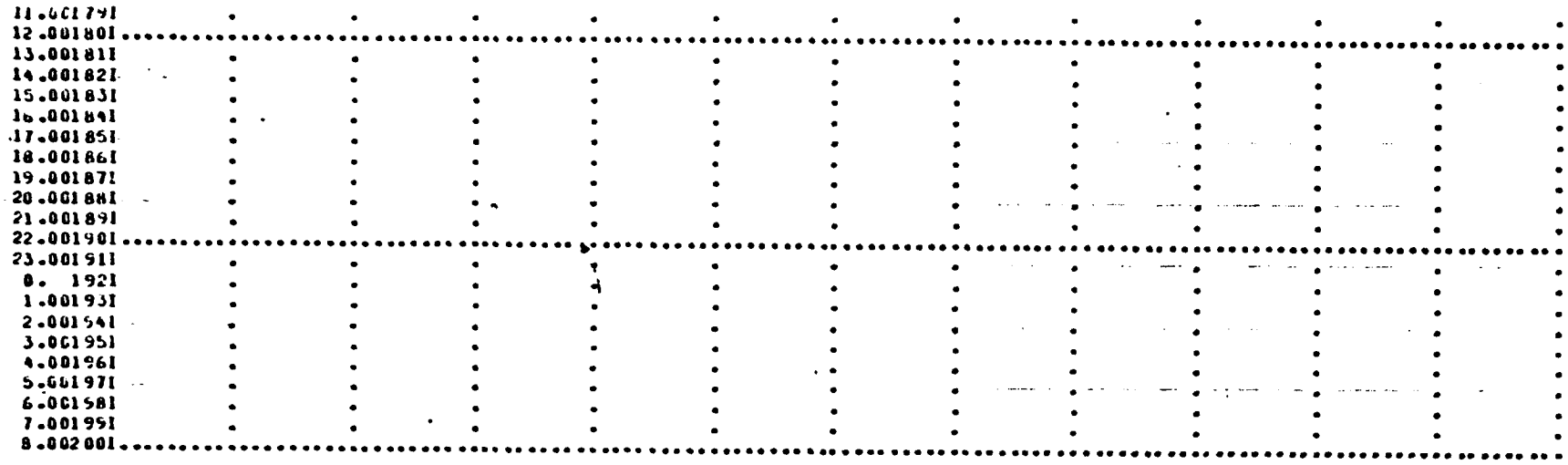
6.001741
7.001751
8.001761
9.001771
10.001781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12.001801
13.001811
14.001821
15.001831
16.001841
17.001851
18.001861
19.001871
20.001881
21.001891
22.001901
23.001911
0. 1921
1.001931
2.001941
3.001951
4.001961
5.001971
6.001981
7.001991
8.002001

```
*OVN*

                                   STATION      1, PLAN 1, RATIO 2

                                  END-OF-PERIOD HYDROGRAPH ORDINATES

                                             OUTFLOW
          8.        10.        11.        10.        10.         9.         8.         7.         6.         6.
          5.         5.         4.         4.         3.         6.        18.        45.        84.       143.
        172.       173.       154.       128.       103.        84.        76.        71.        70.        72.
         78.       108.       177.       298.       472.       628.       819.      1145.      1951.      2332.
       5356.      7703.      9625.     10430.     10036.      8725.      7240.      5834.      4669.      3804.
       3040.      2425.      1925.      1557.      1221.      1018.       925.       826.       740.       662.
        593.       535.       484.       433.       388.       347.       311.       278.       245.       230.
        209.       188.       168.       150.       134.       120.       108.        96.        86.        80.
         73.        66.        60.        53.        48.        43.        38.        34.        31.        28.
         25.        22.        20.        18.        16.        14.        13.        11.        10.         9.
          8.         7.         7.         6.         5.         5.         4.         4.         3.         3.
          3.         2.         2.         2.         2.         2.         1.         1.         1.         1.
          1.         1.         1.         1.         1.         1.         0.         0.         0.         0.
          0.         0.         0.         0.         0.         0.         0.         0.         0.         0.
          0.         0.         0.         0.         0.         0.         0.         0.         0.         0.
          0.         0.         0.         0.         0.         0.         0.         0.         0.         0.
          0.         0.         0.         0.         0.         0.         0.         0.         0.         0.
          0.         0.         0.         0.         0.         0.         0.         0.         0.         0.
          0.         0.         0.         0.         0.         0.         0.         0.         0.         0.
          0.         0.         0.         0.         0.         0.         0.         0.         0.         0.

                                             STORAGE
        173.       173.       173.       173.       173.       173.       173.       173.       173.       173.
        173.       173.       173.       172.       172.       173.       174.       177.       181.       185.
        187.       187.       186.       184.       182.       181.       180.       180.       180.       180.
        181.       183.       187.       194.       201.       206.       211.       220.       234.       252.
        278.       306.       325.       333.       329.       316.       300.       283.       270.       259.
        248.       240.       233.       227.       221.       217.       214.       211.       209.       207.
        205.       203.       201.       199.       197.       196.       194.       193.       192.       191.
        190.       188.       187.       186.       185.       184.       183.       182.       181.       181.
        180.       179.       178.       178.       177.       177.       176.       176.       175.       175.
        175.       174.       174.       174.       174.       174.       173.       173.       173.       173.
        173.       173.       173.       173.       173.       173.       173.       172.       172.       172.
        172.       172.       172.       172.       172.       172.       172.       172.       172.       172.
        172.       172.       172.       172.       172.       172.       172.       172.       172.       172.
        172.       172.       172.       172.       172.       172.       172.       172.       172.       172.
        172.       172.       172.       172.       172.       172.       172.       172.       172.       172.
        172.       172.       172.       172.       172.       172.       172.       172.       172.       172.
        172.       172.       172.       172.       172.       172.       172.       172.       172.       172.
        172.       172.       172.       172.       172.       172.       172.       172.       172.       172.
        172.       172.       172.       172.       172.       172.       172.       172.       172.       172.
        172.       172.       172.       172.       172.       172.       172.       172.       172.       172.

                                              STAGE
      1061.1     1061.1     1061.1     1061.1     1061.1     1061.1     1061.1     1061.1     1061.1     1061.1
      1061.1     1061.1     1061.0     1061.0     1061.0     1061.1     1061.2     1061.5     1062.0     1062.4
      1062.5     1062.5     1062.4     1062.3     1062.1     1062.0     1061.9     1061.8     1061.8     1061.8
      1061.9     1062.1     1062.6     1063.2     1063.7     1064.2     1064.6     1065.2     1066.1     1067.2
      1068.6     1069.9     1070.7     1071.0     1070.9     1070.3     1069.6     1068.8     1068.2     1067.6
      1067.0     1066.5     1066.1     1065.7     1065.2     1065.0     1064.8     1064.6     1064.4     1064.2
      1064.1     1063.9     1063.8     1063.6     1063.5     1063.3     1063.2     1063.1     1063.0     1062.9
      1062.8     1062.6     1062.5     1062.4     1062.3     1062.2     1062.1     1062.1     1062.0     1061.9
      1061.9     1061.8     1061.7     1061.6     1061.6     1061.5     1061.4     1061.4     1061.4     1061.3
      1061.3     1061.3     1061.2     1061.2     1061.2     1061.2     1061.1     1061.1     1061.1     1061.1
```

```
   1061.1    1061.1    1061.1    1061.1    1061.1    1061.1    1061.0    1061.0    1061.0    1061.0
   1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0
   1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0
   1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0
   1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0
   1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0
   1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0
   1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0
   1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0
   1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0

PEAK OUTFLOW IS    10430. AT TIME  44.00 HOURS

                          PEAK    6-HOUR    24-HOUR    72-HOUR   TOTAL VOLUME
               CFS      10430.     8804.      3960.      1442.        104214.
               CMS        295.      249.       112.        41.          2951.
            INCHES                  4.42       7.96       8.70           8.73
                MM                112.38     202.19     220.87         221.71
             AC-FT                  4366.      7854.      8580.          8613.
        THOUS CU M.                 5385.      9688.     10583.         10624.
```

OVF

STATION 1

INFLOW(I), OUTFLOW(O) AND OBSERVED FLOW(*)

	0.	2000.	4000.	6000.	8000.	10000.	12000.	0.	0.	.0.	0.	0.	0.
1.00	11												
2.00	21												
3.00	31												
4.00	41												
5.00	51												
6.00	61												
7.00	71												
8.00	81												
9.00	91												
10.00	101												
11.00	111												
12.00	121												
13.00	131												
14.00	141												
15.00	151												
16.00	161												
17.00	171												
18.00	181												
19.00	191												
20.00	201												
21.00	211												
22.00	221												
23.00	231												
0.	241												
1.00	2510												
2.00	261												
3.00	271												
4.00	281												
5.00	291												
6.00	301												
7.00	311												
8.00	321												
9.00	331												
10.00	34.01												
11.00	35. 01												
12.00	36. I												
13.00	37. I												
14.00	38. 01												
15.00	39. 01												
16.00	40.		01										
17.00	41.			0 I.									
18.00	42.				01								
19.00	43.					01.							
20.00	44.						I						
21.00	45.					I							
22.00	46.				I0								
23.00	47.			I0									
0.	48.			IG.									
1.00	49.		I										
2.00	50.		I0										
3.00	51.	I											
4.00	52.	I											
5.00	53.	I0											
6.00	54.	I0											
7.00	55.	I											
8.00	56.	I											

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 9.00 57.    10
10.00 58.    I
11.00 59.    I
12.00 60...I.....
13.00 61.    I
14.00 62.    I
15.00 63.  I
16.00 64.  I
17.00 65.  I
18.00 66.  I
19.00 67.I0
20.00 68.I
21.00 69.I
22.00 70.I.....
23.00 71.I
 0.   72.I
 1.00 73.I
 2.00 74.I
 3.00 75.I
 4.00 76.I
 5.00 7710
 6.00 781
 7.00 791
 8.00 80I.....
 9.00 811
10.00 821
11.00 831
12.00 841
13.00 851
14.00 861
15.00 871
16.00 881
17.00 891
18.00 90I.....
19.00 911
20.00 921
21.00 931
22.00 941
23.00 951
 0.   961
 1.00 971
 2.00 981
 3.00 991
 4.001001.....
 5.001011
 6.001021
 7.001031
 8.001041
 9.001051
10.001061
11.001071
12.001081
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19.001151
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21.001171
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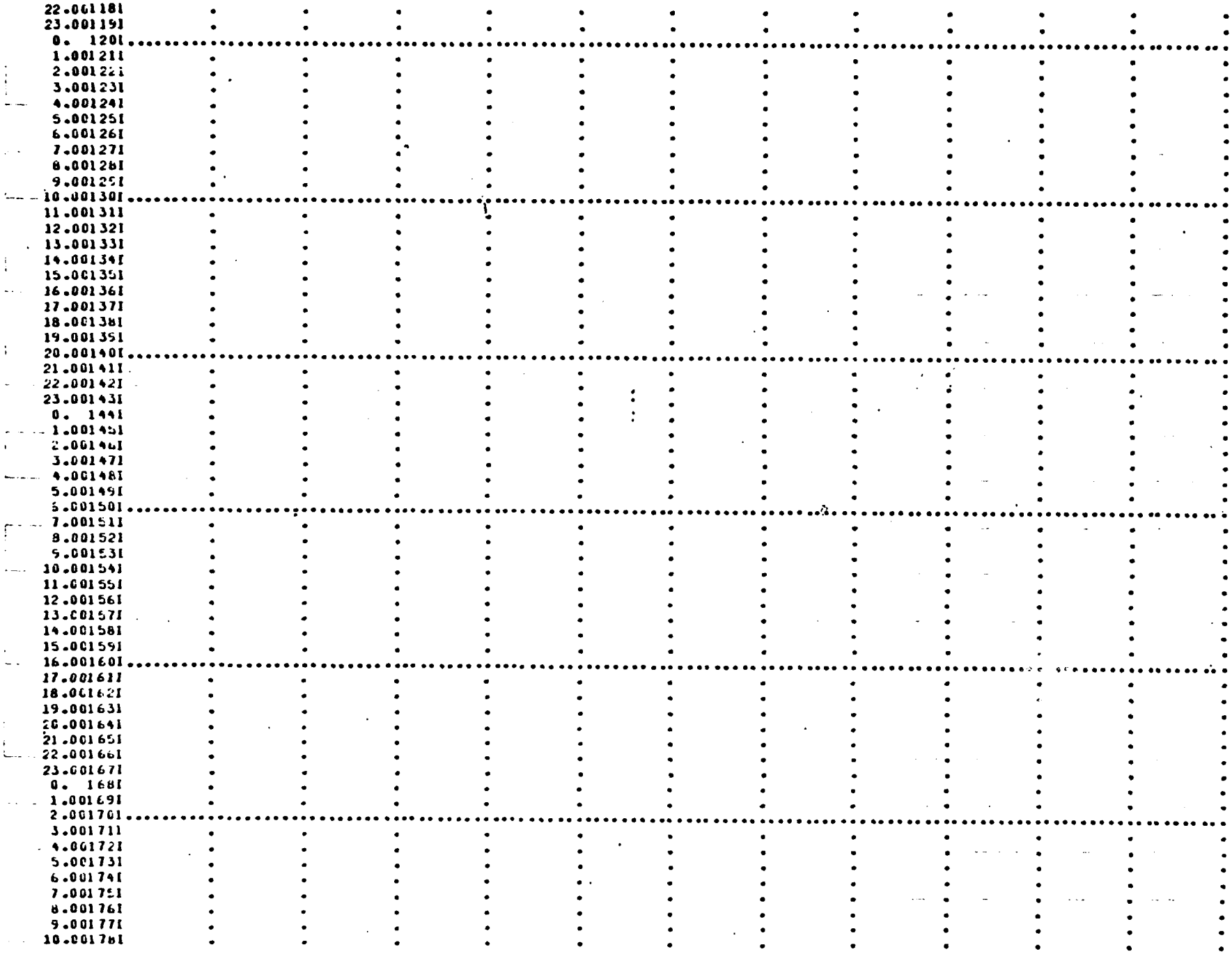
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10.001301
11.001311
12.001321
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14.001341
15.001351
16.001361
17.001371
18.001381
19.001391
20.001401
21.001411
22.001421
23.001431
0. 1441
1.001451
2.001461
3.001471
4.001481
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6.001501
7.001511
8.001521
9.001531
10.001541
11.001551
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14.001581
15.001591
16.001601
17.001611
18.001621
19.001631
20.001641
21.001651
22.001661
23.001671
0. 1681
1.001691
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4.001721
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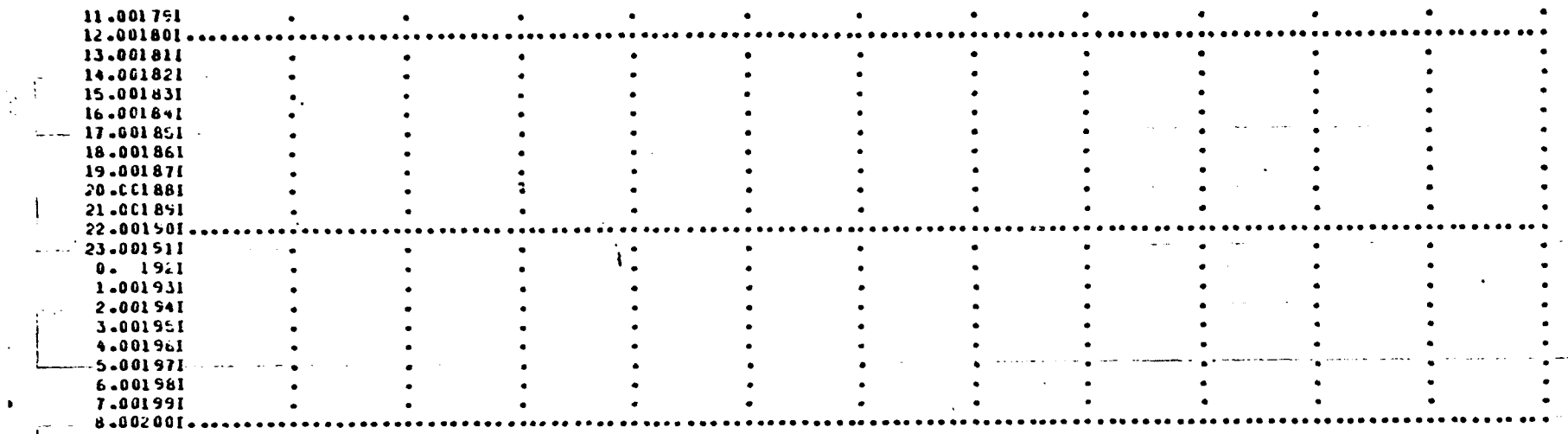
6.001741
7.001751
8.001761
9.001771
10.001781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19.001871
20.001881
21.001891
22.001901
23.001911
0. 1921
1.001931
2.001941
3.001951
4.001961
5.001971
6.001981
7.001991
8.002001

```
•DWN•

                              STATION      1, PLAN 1, RATIO 3

                             END-OF-PERIOD HYDROGRAPH ORDINATES

                                          OUTFLOW
     10.       13.       14.       13.       12.       11.       10.        9.        8.        7.
      6.        6.        5.        5.        4.        7.       23.       56.      113.      180.
    214.      216.      193.      150.      129.      105.       50.       85.       85.       50.
    102.      140.      221.      336.      591.      802.     1017.     1532.     2462.     4132.
   6767.     9657.    12042.    13033.    12547.    10900.     8954.     7284.     5863.     4656.
   3816.     3035.     2412.     1905.     1541.     1268.     1134.     1018.      929.      829.
    742.      664.      595.      537.      486.      435.      389.      348.      312.      279.
    250.      230.      209.      188.      169.      151.      135.      121.      108.       97.
     87.       80.       73.       66.       60.       54.       48.       43.       38.       34.
     31.       28.       25.       22.       20.       18.       16.       14.       13.       11.
     10.        9.        8.        7.        7.        6.        5.        5.        4.        4.
      3.        3.        3.        2.        2.        2.        2.        2.        1.        1.
      1.        1.        1.        1.        1.        1.        1.        1.        0.        0.
      0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
      0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
      0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
      0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
      0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
      0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
      0.        0.        0.        0.        0.        0.        0.        0.        0.        0.

                                          STORAGE
    173.      173.      173.      173.      173.      173.      173.      173.      173.      173.
    173.      173.      173.      173.      173.      173.      174.      178.      183.      188.
    190.      190.      188.      186.      184.      183.      182.      181.      181.      182.
    182.      185.      190.      198.      205.      211.      217.      226.      240.      264.
    294.      325.      348.      357.      352.      337.      319.      301.      284.      271.
    259.      248.      239.      233.      227.      222.      219.      217.      214.      212.
    209.      207.      205.      203.      201.      199.      197.      196.      194.      193.
    192.      191.      190.      188.      187.      186.      185.      184.      183.      182.
    181.      181.      180.      179.      178.      178.      177.      177.      176.      176.
    175.      175.      175.      174.      174.      174.      174.      174.      173.      173.
    173.      173.      173.      173.      173.      173.      173.      173.      173.      172.
    172.      172.      172.      172.      172.      172.      172.      172.      172.      172.
    172.      172.      172.      172.      172.      172.      172.      172.      172.      172.
    172.      172.      172.      172.      172.      172.      172.      172.      172.      172.
    172.      172.      172.      172.      172.      172.      172.      172.      172.      172.
    172.      172.      172.      172.      172.      172.      172.      172.      172.      172.
    172.      172.      172.      172.      172.      172.      172.      172.      172.      172.
    172.      172.      172.      172.      172.      172.      172.      172.      172.      172.
    172.      172.      172.      172.      172.      172.      172.      172.      172.      172.
    172.      172.      172.      172.      172.      172.      172.      172.      172.      172.

                                           STAGE
  1061.1    1061.2    1061.2    1061.2    1061.1    1061.1    1061.1    1061.1    1061.1    1061.1
  1061.1    1061.1    1061.1    1061.1    1061.0    1061.1    1061.3    1061.7    1062.2    1062.6
  1062.8    1062.6    1062.7    1062.5    1062.3    1062.1    1062.0    1062.0    1062.0    1062.0
  1062.1    1062.3    1062.9    1063.5    1064.1    1064.5    1065.0    1065.6    1066.5    1067.8
  1069.4    1070.7    1071.7    1072.0    1071.9    1071.2    1070.5    1067.6    1068.8    1068.2
  1067.6    1067.0    1066.5    1065.0    1065.6    1065.3    1065.1    1065.0    1064.8    1064.6
  1064.4    1064.2    1064.1    1063.9    1063.8    1063.6    1063.5    1063.3    1063.2    1063.1
  1063.0    1062.9    1062.8    1062.6    1062.5    1062.4    1062.3    1062.2    1062.1    1062.1
  1062.0    1061.9    1061.9    1061.8    1061.7    1061.6    1061.6    1061.5    1061.4    1061.4
  1061.4    1061.3    1061.3    1061.3    1061.2    1061.2    1061.2    1061.2    1061.1    1061.1
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   1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0
   1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0
   1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0
   1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0
   1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0
   1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0
   1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0
   1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0
   1061.0    1061.0    1061.0    1061.0

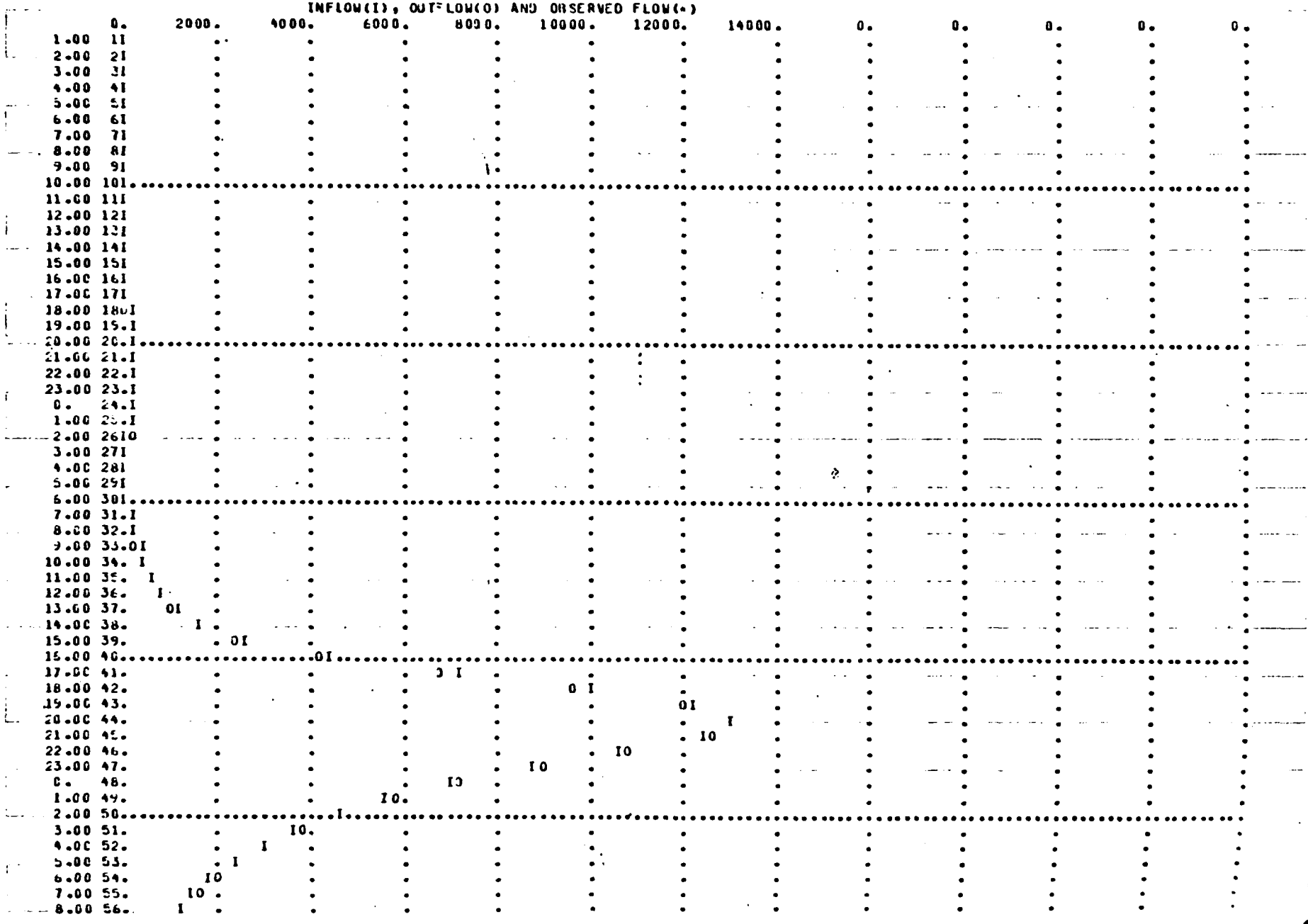
PEAK OUTFLOW IS    13033. AT TIME  44.00 HOURS

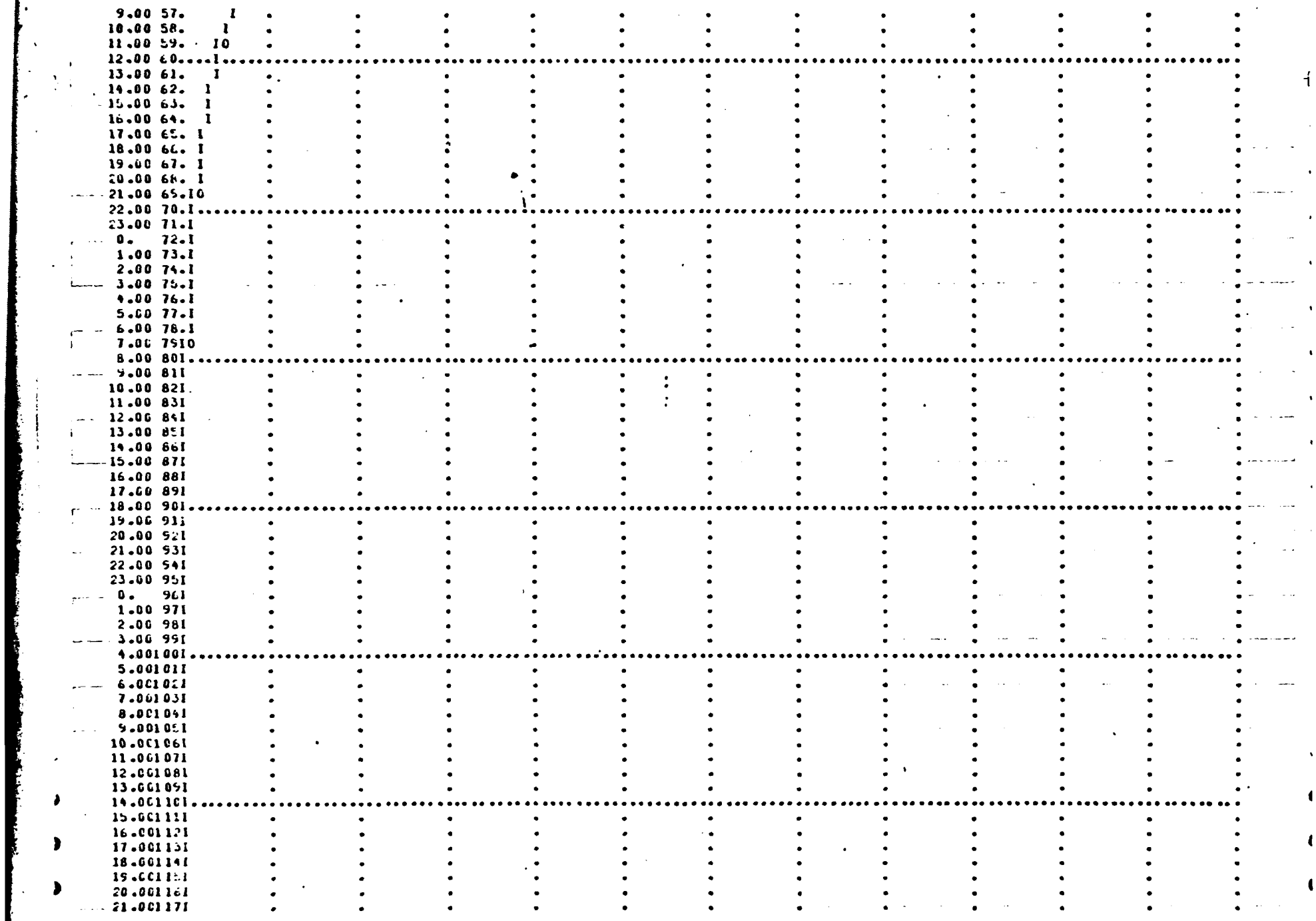
                        PEAK    6-HOUR    24-HOUR    72-HOUR   TOTAL VOLUME
              CFS     13033.    11010.     4950.      1802.       130266.
              CMS       369.      312.      140.        51.         3689.
           INCHES                 5.53      9.95      10.87         10.91
               MM               140.54    252.75     276.09        277.14
            AC-FT                5459.     9818.     10725.        10766.
       THOUS CU M                6734.    12111.     13229.        13279.
```

JWF

STATION 1

INFLOW(I), OUTFLOW(O) AND OBSERVED FLOW(*)

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11.00 59. I0
12.00 60.I
13.00 61. I
14.00 62. I
15.00 63. I
16.00 64. I
17.00 65. I
18.00 66. I
19.00 67. I
20.00 68. I
21.00 65.I0
22.00 70.I
23.00 71.I
0. 72.I
1.00 73.I
2.00 74.I
3.00 75.I
4.00 76.I
5.00 77.I
6.00 78.I
7.00 79I0
8.00 801
9.00 811
10.00 821
11.00 831
12.00 841
13.00 851
14.00 861
15.00 871
16.00 881
17.00 891
18.00 901
19.00 911
20.00 921
21.00 931
22.00 941
23.00 951
0. 961
1.00 971
2.00 981
3.00 991
4.001001
5.001011
6.001021
7.001031
8.001041
9.001051
10.001061
11.001071
12.001081
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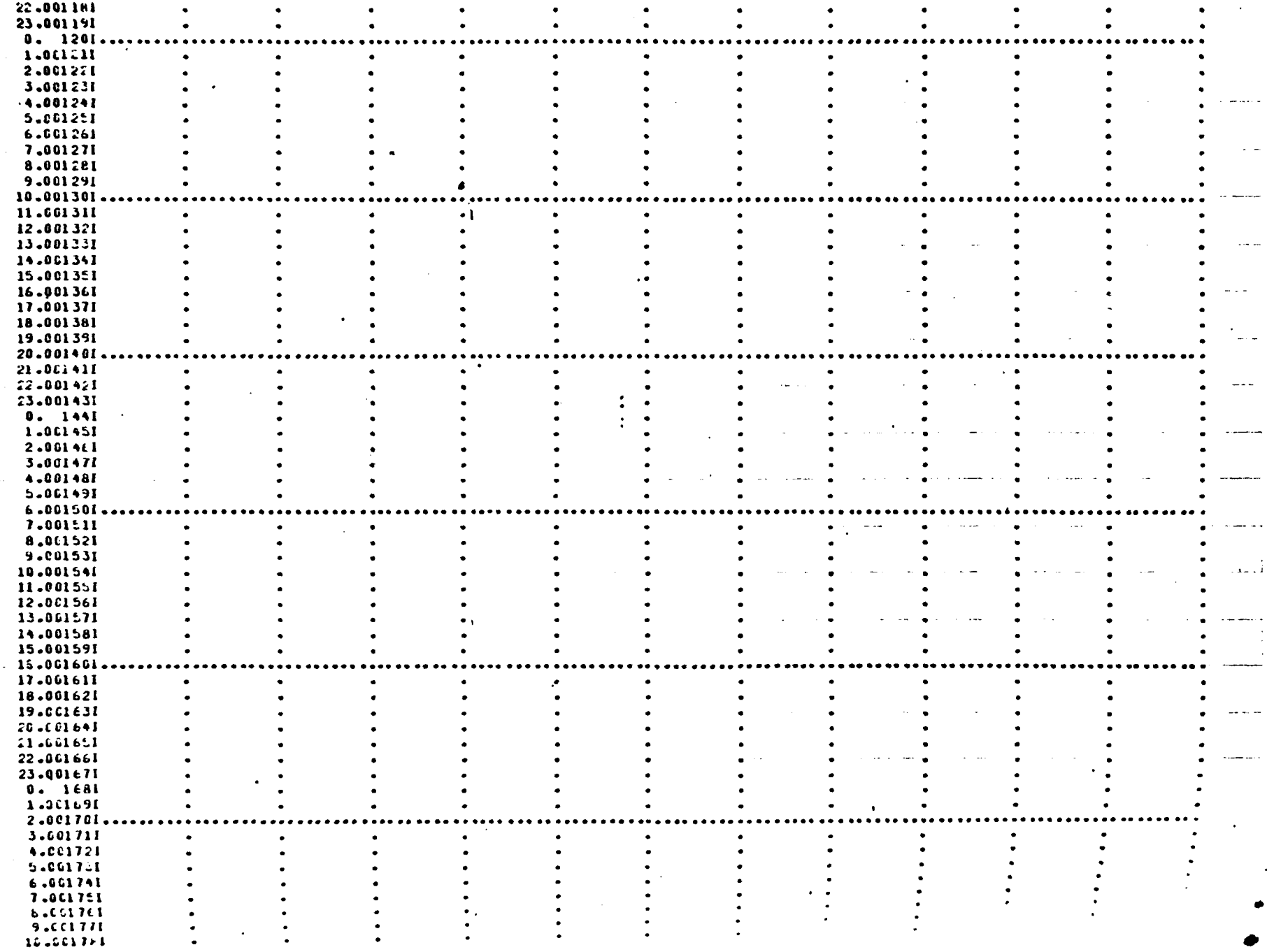
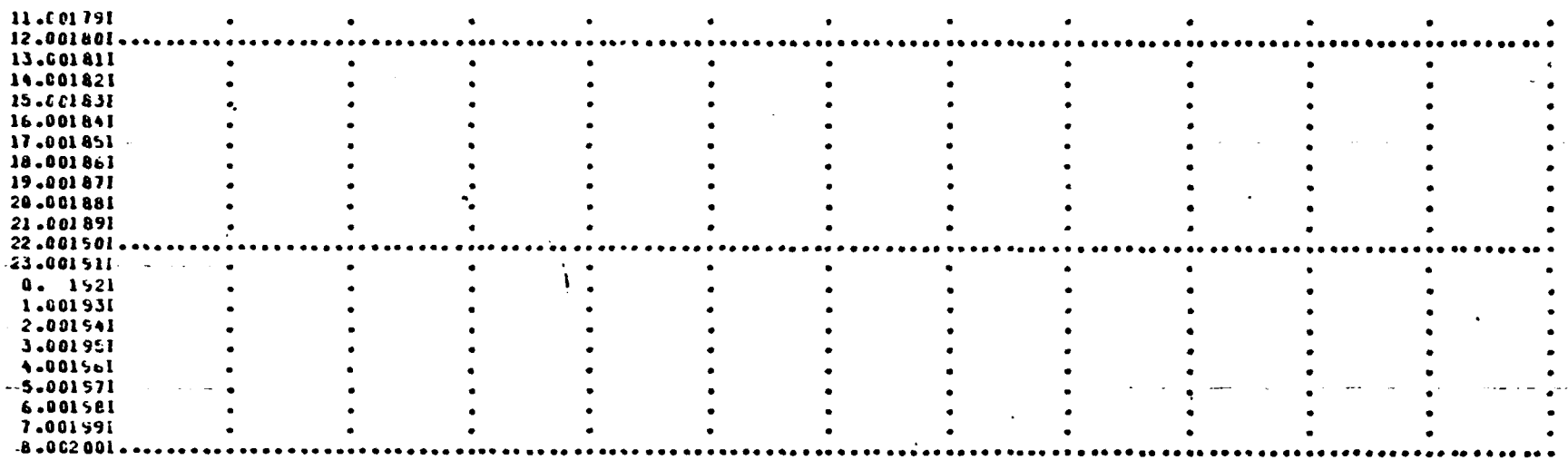
14.001101
15.001111
16.001121
17.001131
18.001141
19.001151
20.001161
21.001171

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13.001811
14.001821
15.001831
16.001841
17.001851
18.001861
19.001871
20.001881
21.001891
22.001901
23.001911
0. 1921
1.001931
2.001941
3.001951
4.001961
5.001971
6.001981
7.001991
8.002001

DVN

STATION 1, PLAN 1, RATIO 4

END-OF-PERIOD HYDROGRAPH ORDINATES

OUTFLOW

11.	16.	16.	16.	14.	13.	12.	11.	10.	9.
8.	7.	6.	6.	5.	5.	27.	67.	143.	217.
263.	260.	227.	192.	155.	126.	109.	102.	103.	108.
123.	167.	272.	485.	727.	956.	1261.	1818.	2997.	4961.
8114.	11680.	14395.	15685.	15013.	13092.	10780.	8696.	7036.	5651.
4527.	3670.	2891.	2292.	1809.	1540.	1355.	1223.	1091.	987.
893.	798.	715.	640.	573.	520.	468.	419.	375.	335.
300.	269.	242.	224.	202.	181.	162.	145.	130.	116.
104.	93.	84.	78.	71.	64.	58.	52.	46.	41.
37.	33.	30.	27.	24.	21.	19.	17.	15.	14.
12.	11.	10.	9.	8.	7.	6.	6.	5.	5.
4.	4.	3.	3.	3.	2.	2.	2.	2.	2.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

STORAGE

173.	174.	174.	174.	174.	173.	173.	173.	173.	173.
173.	173.	173.	173.	173.	173.	175.	179.	185.	150.
193.	193.	191.	188.	186.	184.	183.	182.	182.	183.
184.	187.	193.	201.	209.	215.	221.	232.	247.	273.
311.	344.	369.	381.	375.	357.	336.	316.	298.	281.
269.	257.	246.	238.	232.	227.	223.	221.	219.	216.
213.	211.	208.	206.	204.	202.	200.	198.	197.	195.
194.	193.	192.	191.	189.	188.	186.	185.	184.	183.
183.	182.	181.	180.	180.	179.	178.	178.	177.	176.
176.	176.	175.	175.	175.	174.	174.	174.	174.	173.
173.	173.	173.	173.	173.	173.	173.	173.	173.	173.
173.	172.	172.	172.	172.	172.	172.	172.	172.	172.
172.	172.	172.	172.	172.	172.	172.	172.	172.	172.
172.	172.	172.	172.	172.	172.	172.	172.	172.	172.
172.	172.	172.	172.	172.	172.	172.	172.	172.	172.
172.	172.	172.	172.	172.	172.	172.	172.	172.	172.
172.	172.	172.	172.	172.	172.	172.	172.	172.	172.
172.	172.	172.	172.	172.	172.	172.	172.	172.	172.
172.	172.	172.	172.	172.	172.	172.	172.	172.	172.

STAGE

1061.1	1061.2	1061.2	1061.2	1061.2	1061.2	1061.1	1061.1	1061.1	1061.1
1061.1	1061.1	1061.1	1061.1	1061.1	1061.1	1061.3	1061.8	1062.4	1062.8
1063.1	1063.0	1062.9	1062.7	1062.4	1062.3	1062.1	1062.1	1062.1	1062.1
1062.2	1062.5	1063.1	1063.8	1064.4	1064.9	1065.3	1065.8	1066.9	1068.3
1070.1	1071.5	1072.6	1073.0	1072.8	1072.1	1071.2	1070.3	1069.5	1068.7
1068.1	1067.5	1066.8	1065.4	1066.0	1065.6	1065.4	1065.2	1065.1	1064.9
1064.7	1064.5	1064.3	1064.2	1064.0	1063.9	1063.7	1063.6	1063.4	1063.3
1063.2	1063.1	1063.0	1062.9	1062.7	1062.6	1062.5	1062.4	1062.3	1062.2
1062.1	1062.0	1062.0	1061.9	1061.8	1061.7	1061.7	1061.6	1061.5	1061.4
1061.4	1061.4	1061.3	1061.3	1061.2	1061.2	1061.2	1061.1	1061.1	1061.1

```
    1061.1    1061.1    1061.1    1061.1    1061.1    1061.1    1061.1    1061.1    1061.1    1061.1
    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0
    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0
    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0
    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0
    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0
    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0
    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0
    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0
    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0

PEAK OUTFLOW IS    15675. AT TIME  44.00 HOURS

                            PEAK    6-HOUR    24-HOUR    72-HOUR    TOTAL VOLUME
                  CFS     15675.    13221.      5940.      2163.         156319.
                  CMS       444.      374.       168.        61.           4426.
               INCHES                 6.54      11.94      13.04           13.09
                   MM               168.76     303.30     331.30          332.57
                AC-FT                6556.     11782.     12870.          12919.
           THOUS CU M                8086.     14533.     15875.          15935.
```

•OWF•

STATION 1

INFLOW(I), OUTFLOW(O) AND OBSERVED FLOW(•)

```
          0.    2000.    4000.    6000.    8000.   10000.   12000.   14000.   16000.      0.       0.       0.       0.
 1.00  11
 2.00  21
 3.00  31
 4.00  41
 5.00  51
 6.00  61
 7.00  71
 8.00  81
 9.00  91
10.00 101.....................................................................................................
11.00 111
12.00 121
13.00 131
14.00 141
15.00 151
16.00 161
17.00 171
18.00 1801
19.00 19.I
20.00 20.I.....................................................................................................
21.00 21.I
22.00 22.I
23.00 23.I
 0.   24.I
 1.00 25.I
 2.00 26.I
 3.00 2710
 4.00 2810
 5.00 29.I
 6.00 30.I.....................................................................................................
 7.00 31.I
 8.00 32.I
 9.00 33.OI
10.00 34. OI
11.00 35.   I
12.00 36.    I
13.00 37.     OI
14.00 38.       OI
15.00 39.         OI
16.00 40.....................O.I.....................................................................
17.00 41.                  .O I
18.00 42.                      .O I
19.00 43.                          .OI
20.00 44.                            .  I
21.00 45.                           .   IO
22.00 46.                      .        .IO
23.00 47.                      .    IO  .
 0.   48.                      .  IO    .
 1.00 49.                  .IO  .       .
 2.00 50.....................IO.........................................................................
 3.00 51.                .IO  .
 4.00 52.              I  .   .
 5.00 53.            I    .   .
 6.00 54.          .I     .   .
 7.00 55.        I.       .   .
 8.00 56.      IO .       .   .
```

```
 9.00 57.       I
10.00 58.      I
11.00 59.     I
12.00 60.....I.....
13.00 61.    I
14.00 62.    I
15.00 63.   10
16.00 64.   I
17.00 65.   I
18.00 66.  10
19.00 67.  I
20.00 68.  I
21.00 69.  I
22.00 70..I.....
23.00 71.10
 0.   72.I
 1.00 73.I
 2.00 74.I
 3.00 75.I
 4.00 76.I
 5.00 77.I
 6.00 78.I
 7.00 79.I
 8.00 80.I.....
 9.00 8110
10.00 821
11.00 831
12.00 841
13.00 851
14.00 861
15.00 871
16.00 881
17.00 891
18.00 901.....
19.00 911
20.00 921
21.00 931
22.00 941
23.00 951
 0.   961
 1.00 971
 2.00 981
 3.00 991
 4.001001.....
 5.001011
 6.001021
 7.001031
 8.001041
 9.001051
10.001061
11.001071
12.001081
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17.001131
18.001141
19.001151
20.001161
21.001171
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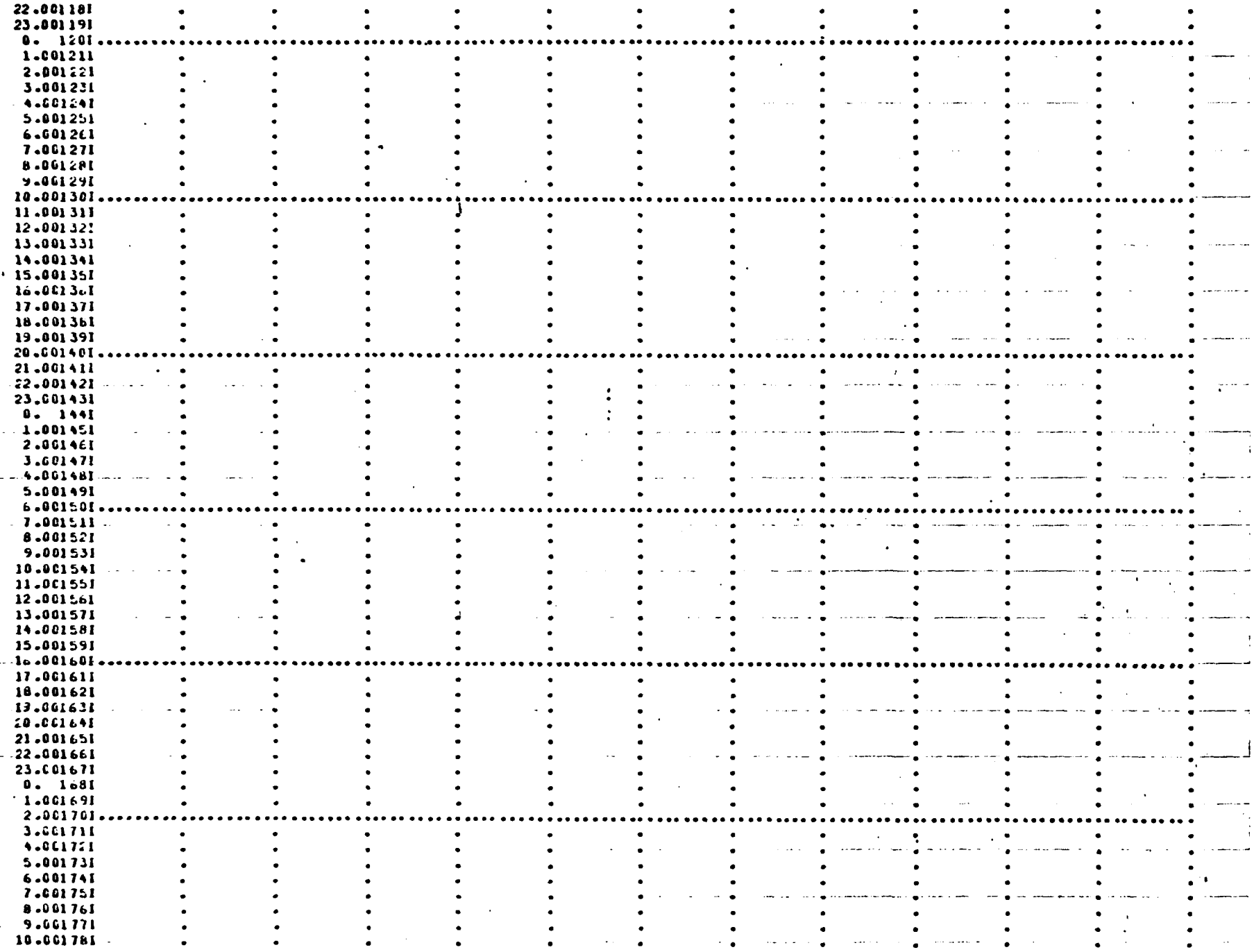
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4.001241
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6.001261
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8.001281
9.001291
10.001301
11.001311
12.001321
13.001331
14.001341
15.001351
16.001361
17.001371
18.001381
19.001391
20.001401
21.001411
22.001421
23.001431
0. 1441
1.001451
2.001461
3.001471
4.001481
5.001491
6.001501
7.001511
8.001521
9.001531
10.001541
11.001551
12.001561
13.001571
14.001581
15.001591
16.001601
17.001611
18.001621
19.001631
20.001641
21.001651
22.001661
23.001671
0. 1681
1.001691
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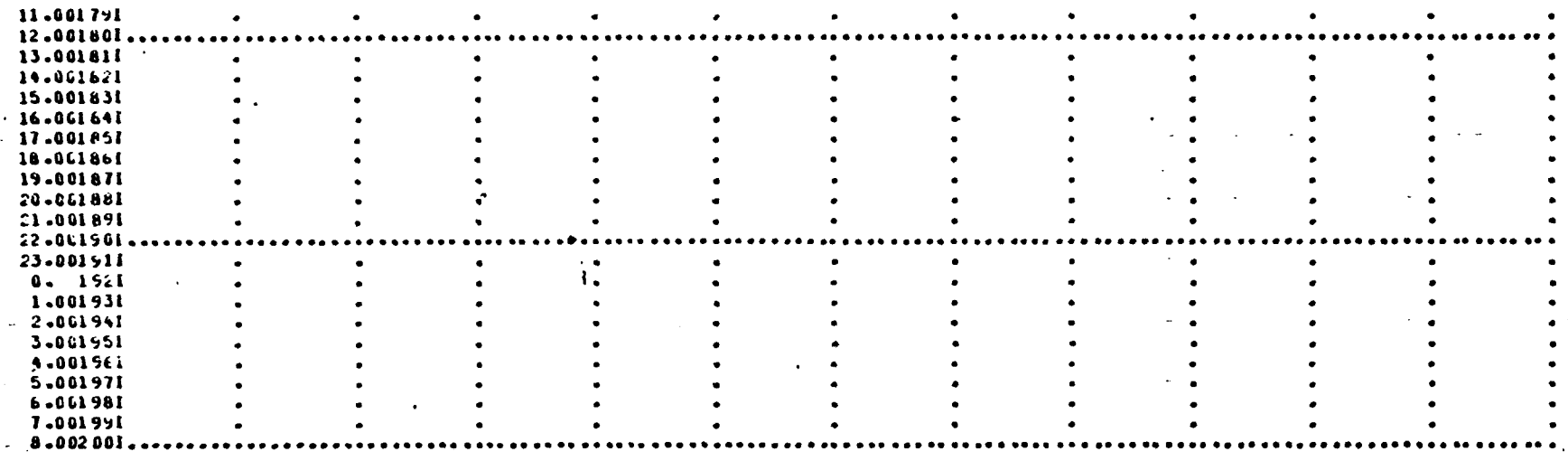
3.001711
4.001721
5.001731
6.001741
7.001751
8.001761
9.001771
10.001781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22.001901
23.001911
0. 1921
1.001931
2.001941
3.001951
4.001961
5.001971
6.001981
7.001991
8.002001

DVN

STATION 1, PLAN 1, RATIO 5

END-OF-PERIOD HYDROGRAPH ORDINATES

CUTFLOW

15.	21.	22.	21.	19.	18.	16.	14.	13.	11.
10.	9.	8.	7.	7.	11.	36.	90.	200.	309.
304.	346.	294.	239.	204.	169.	145.	136.	137.	144.
163.	222.	395.	655.	978.	1321.	1677.	2484.	3946.	6713.
10879.	15551.	19208.	20889.	20053.	17454.	14373.	11585.	9305.	7524.
6069.	4816.	3874.	3060.	2413.	2014.	1806.	1634.	1457.	1307.
1169.	1048.	954.	855.	765.	685.	613.	551.	501.	448.
401.	359.	322.	288.	258.	235.	215.	194.	174.	156.
139.	125.	111.	100.	89.	82.	75.	68.	62.	55.
50.	44.	40.	36.	32.	29.	26.	23.	20.	18.
16.	15.	13.	12.	11.	9.	8.	8.	7.	6.
5.	5.	4.	4.	4.	3.	3.	3.	2.	2.
2.	2.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

STORAGE

174.	174.	174.	174.	174.	174.	174.	174.	173.	173.
173.	173.	173.	173.	173.	173.	176.	182.	189.	194.
196.	196.	194.	192.	189.	187.	185.	195.	185.	185.
186.	190.	198.	207.	216.	223.	229.	240.	261.	294.
337.	380.	414.	429.	422.	397.	369.	343.	322.	304.
286.	272.	260.	248.	240.	234.	232.	228.	225.	222.
220.	218.	215.	212.	210.	207.	205.	204.	202.	200.
198.	196.	195.	194.	192.	191.	190.	188.	187.	186.
185.	184.	183.	182.	182.	181.	180.	179.	179.	178.
177.	177.	176.	176.	175.	175.	175.	174.	174.	174.
174.	174.	173.	173.	173.	173.	173.	173.	173.	173.
173.	173.	173.	172.	172.	172.	172.	172.	172.	172.
172.	172.	172.	172.	172.	172.	172.	172.	172.	172.
172.	172.	172.	172.	172.	172.	172.	172.	172.	172.
172.	172.	172.	172.	172.	172.	172.	172.	172.	172.
172.	172.	172.	172.	172.	172.	172.	172.	172.	172.
172.	172.	172.	172.	172.	172.	172.	172.	172.	172.
172.	172.	172.	172.	172.	172.	172.	172.	172.	172.

STAGE

1061.2	1061.2	1061.3	1061.2	1061.2	1061.2	1061.2	1061.2	1061.1	1061.1
1061.1	1061.1	1061.1	1061.1	1061.1	1061.1	1061.4	1062.0	1062.7	1063.2
1063.4	1063.3	1063.2	1063.0	1062.7	1062.5	1062.4	1062.3	1062.3	1062.4
1062.5	1062.9	1063.5	1064.2	1064.9	1065.4	1065.8	1066.3	1067.7	1069.3
1071.2	1073.0	1074.3	1074.9	1074.6	1073.7	1072.6	1071.3	1070.6	1069.8
1069.0	1068.3	1067.6	1067.0	1066.5	1066.1	1066.0	1065.7	1065.5	1065.3
1065.2	1065.0	1064.9	1064.6	1064.4	1064.3	1064.1	1064.0	1063.8	1063.7
1063.5	1063.4	1063.2	1063.1	1063.0	1062.9	1062.8	1062.7	1062.6	1062.5
1062.3	1062.2	1062.2	1062.1	1062.0	1062.0	1061.9	1061.9	1061.8	1061.8
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    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0

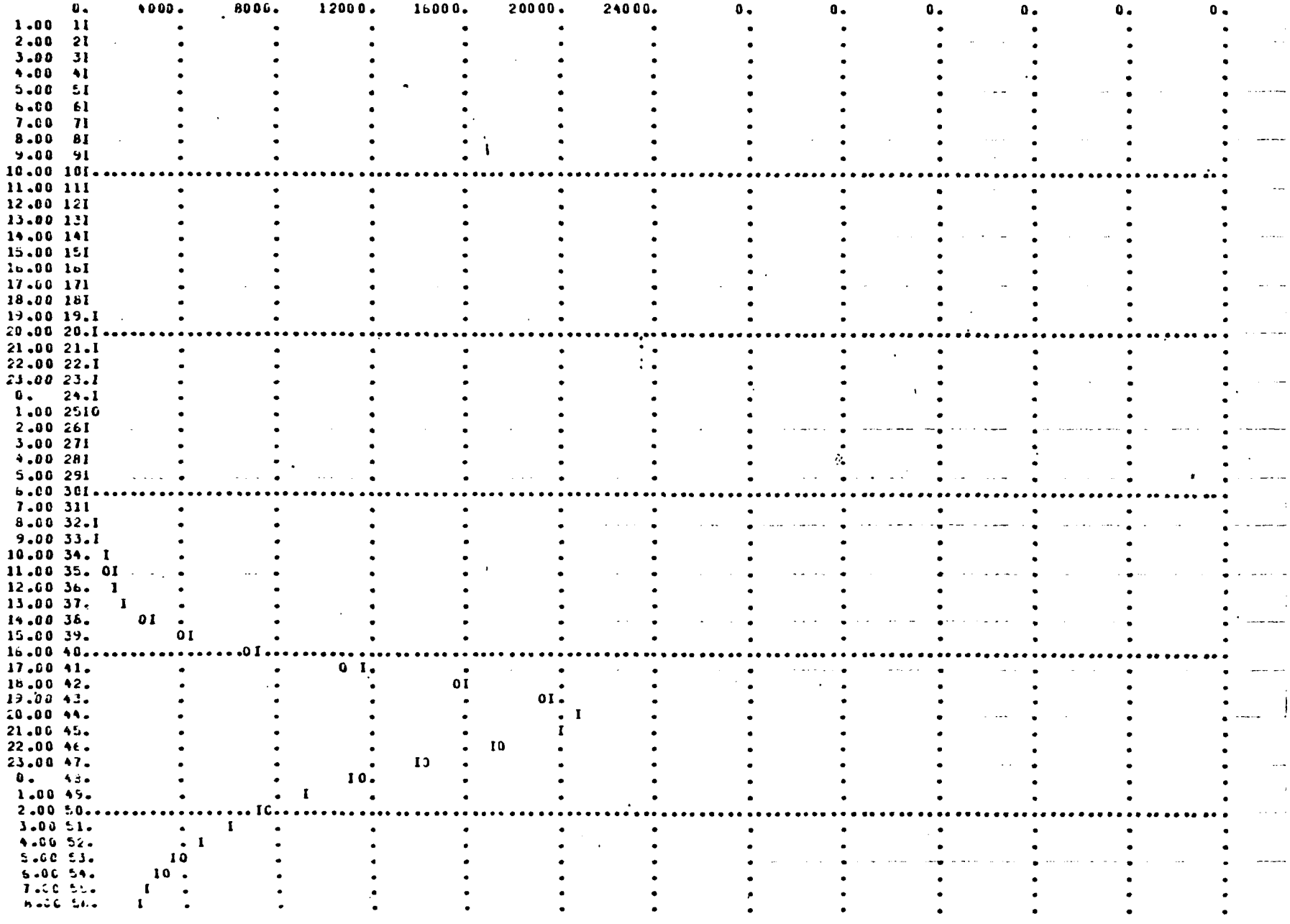
PEAK OUTFLOW IS    20889. AT TIME  44.00 HOURS

                                 PEAK    6-HOUR   24-HOUR   72-HOUR  TOTAL VOLUME
                      CFS      20889.    17630.     7921.     2884.       208426.
                      CMS        592.      499.      224.       82.         5902.
                   INCHES                  8.86     15.92     17.39         17.45
                       MM                225.05    404.43    441.74        443.42
                    AC-FT                 8742.    15711.    17160.        17225.
               THOUS CU M                10783.    19379.    21166.        21247.
```

•OVF•

STATION 1

INFLOW(I), OUTFLOW(O) AND OBSERVED FLOW(•)



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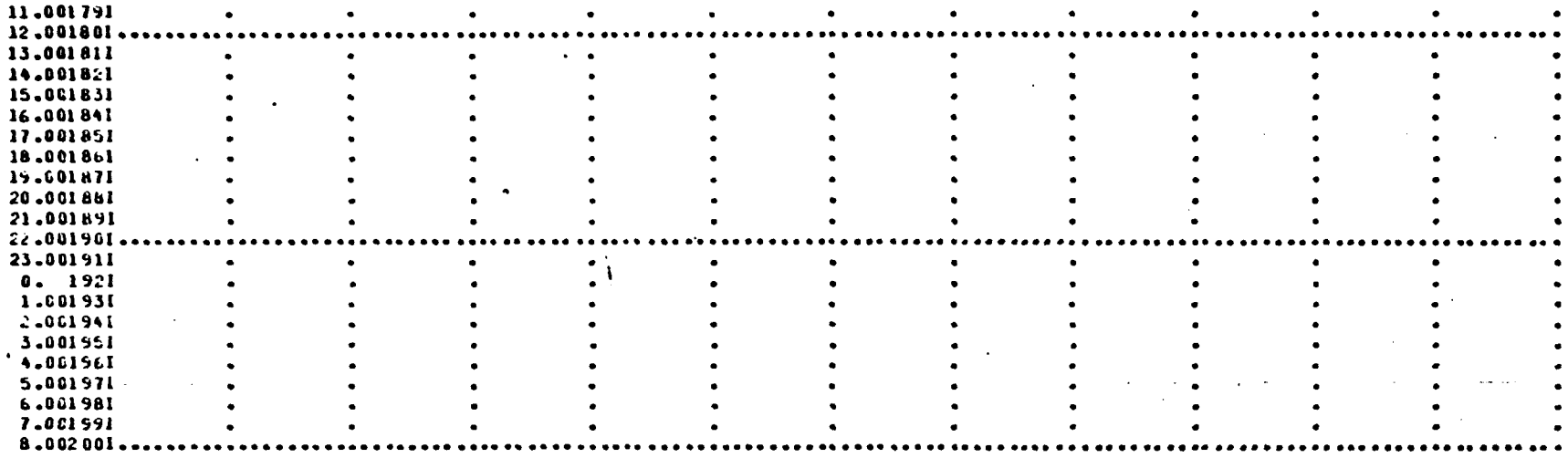
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4.001961
5.001971
6.001981
7.001991
8.002001

OVN

STATION 1, PLAN 1, RATIO 6

END-OF-PERIOD HYDROGRAPH ORDINATES

OUTFLOW

19.	26.	27.	26.	24.	22.	20.	18.	16.	14.
13.	11.	10.	9.	8.	14.	45.	122.	253.	408.
453.	432.	368.	296.	238.	207.	181.	170.	171.	180.
204.	290.	502.	839.	1255.	1646.	2123.	3106.	4953.	8400.
13695.	19378.	24040.	26084.	25085.	21813.	17974.	14477.	11630.	9365.
7544.	6067.	4780.	3837.	3022.	2520.	2253.	2020.	1812.	1639.
1462.	1311.	1173.	1051.	956.	858.	768.	688.	616.	552.
503.	450.	403.	360.	323.	285.	259.	236.	216.	195.
174.	156.	140.	125.	112.	100.	90.	82.	76.	69.
62.	55.	50.	44.	40.	36.	32.	29.	26.	23.
21.	18.	16.	15.	13.	12.	11.	9.	8.	8.
7.	6.	5.	5.	4.	4.	4.	3.	3.	3.
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1.	1.	1.	1.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
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0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

STORAGE

174.	175.	175.	175.	175.	174.	174.	174.	174.	174.
173.	173.	173.	173.	173.	174.	177.	184.	192.	198.
200.	199.	197.	194.	192.	189.	188.	187.	187.	188.
189.	194.	202.	212.	221.	229.	236.	249.	273.	313.
363.	419.	459.	478.	469.	438.	402.	370.	344.	323.
304.	286.	272.	259.	248.	241.	237.	234.	232.	228.
225.	222.	220.	218.	215.	212.	210.	208.	206.	204.
202.	200.	198.	196.	195.	194.	193.	191.	190.	189.
187.	186.	185.	184.	183.	182.	182.	181.	180.	179.
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174.	174.	174.	174.	173.	173.	173.	173.	173.	173.
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172.	172.	172.	172.	172.	172.	172.	172.	172.	172.
172.	172.	172.	172.	172.	172.	172.	172.	172.	172.
172.	172.	172.	172.	172.	172.	172.	172.	172.	172.
172.	172.	172.	172.	172.	172.	172.	172.	172.	172.
172.	172.	172.	172.	172.	172.	172.	172.	172.	172.
172.	172.	172.	172.	172.	172.	172.	172.	172.	172.

STAGE

1061.2	1061.3	1061.3	1061.3	1061.3	1061.3	1061.2	1061.2	1061.2	1061.2
1061.1	1061.1	1061.1	1061.1	1061.1	1061.2	1061.5	1062.2	1063.0	1063.5
1063.7	1063.6	1063.4	1063.2	1063.0	1062.8	1062.6	1062.3	1062.5	1062.6
1062.7	1063.1	1063.8	1064.6	1065.3	1065.8	1066.2	1067.0	1068.3	1070.2
1072.3	1074.4	1076.1	1075.8	1076.4	1075.3	1073.9	1072.6	1071.5	1070.6
1069.8	1069.0	1068.2	1067.6	1066.9	1066.5	1066.3	1066.1	1066.0	1065.8
1065.5	1065.4	1065.2	1065.0	1064.9	1064.8	1064.5	1064.1	1064.1	1064.0
1063.8	1063.7	1063.5	1063.4	1063.3	1063.1	1063.0	1062.9	1062.8	1062.7
1062.6	1062.4	1062.3	1062.2	1062.2	1062.1	1062.0	1061.9	1061.9	1061.9
1061.7	1061.6	1061.6	1061.5	1061.5	1061.4	1061.4	1061.3	1061.3	1061.3

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  1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0    1061.0

PEAK OUTFLOW IS    26087. AT TIME  44.00 HOURS

                              PEAK    6-HOUR   24-HOUR   72-HOUR   TOTAL VOLUME
                    CFS     26087.    22033.     9901.     3605.       260332.
                    CMS       739.      624.      280.      102.         7377.
                 INCHES                11.08     19.90     21.74         21.82
                     MM               281.33    505.54    552.17        554.28
                  AC-FT               10929.    15638.    21450.        21532.
             THOUS CU M               13480.    24223.    26458.        26559.
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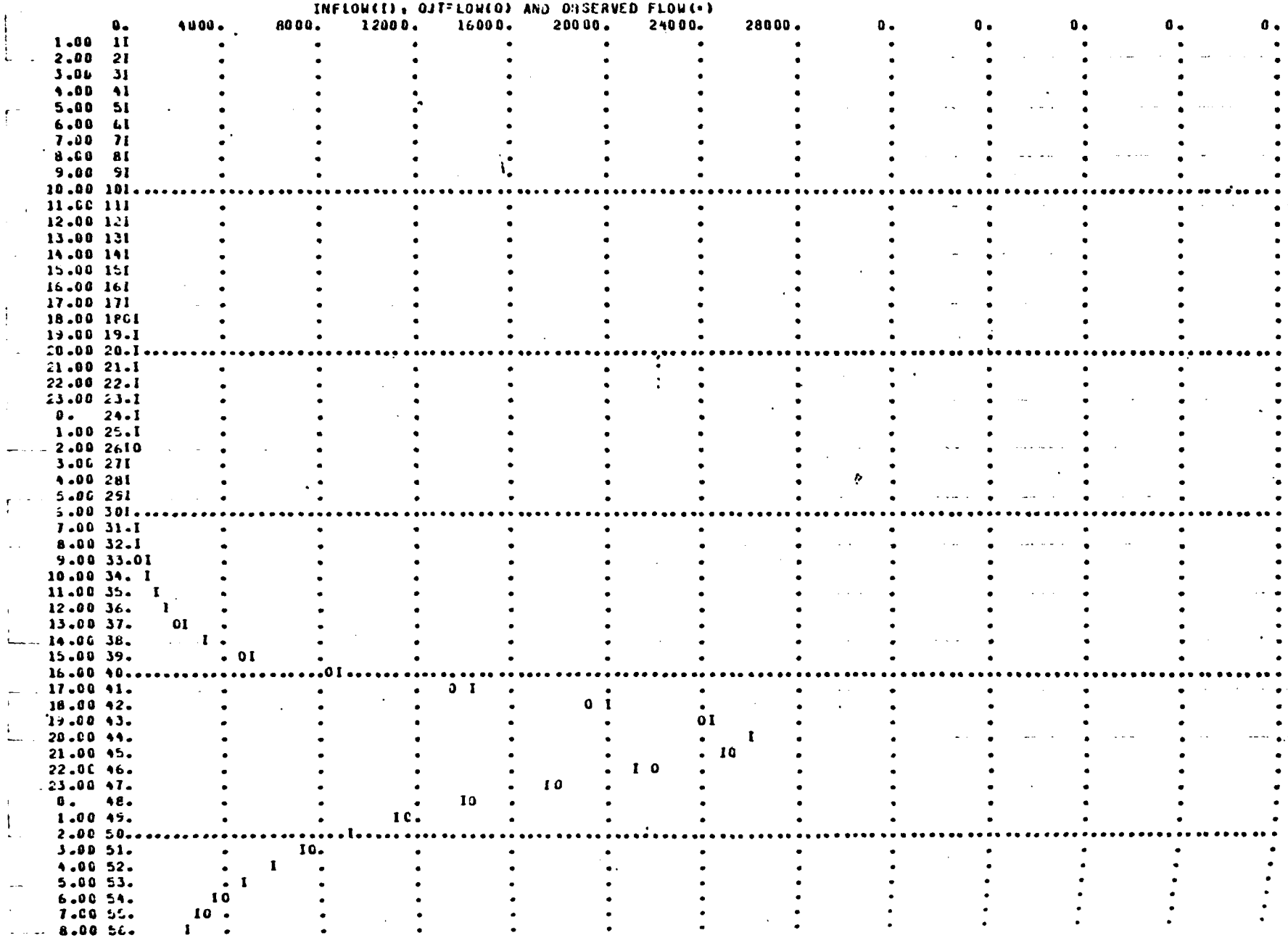
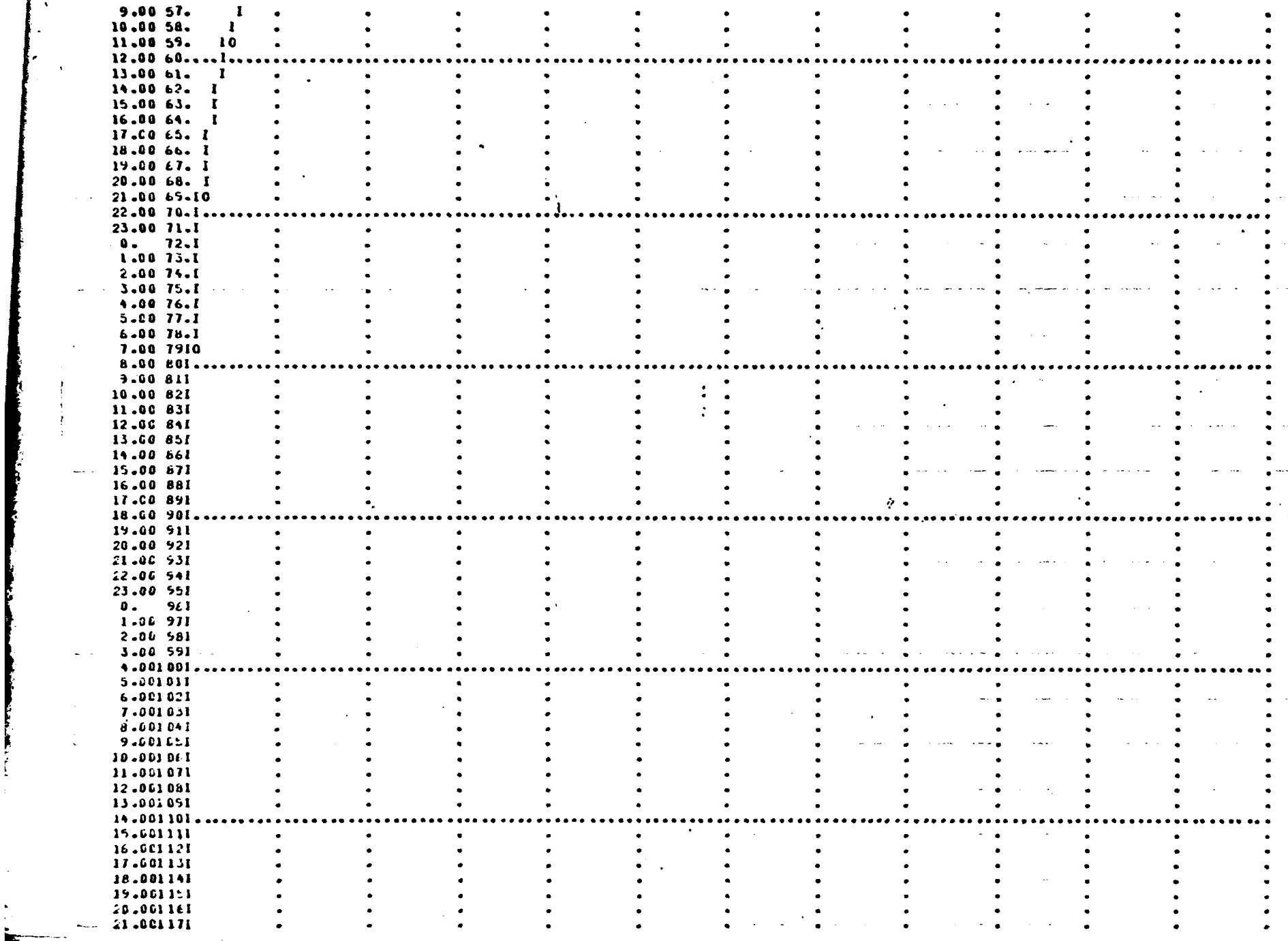
DVF

STATION 1

INFLOW(I), OUTFLOW(O) AND OBSERVED FLOW(*)

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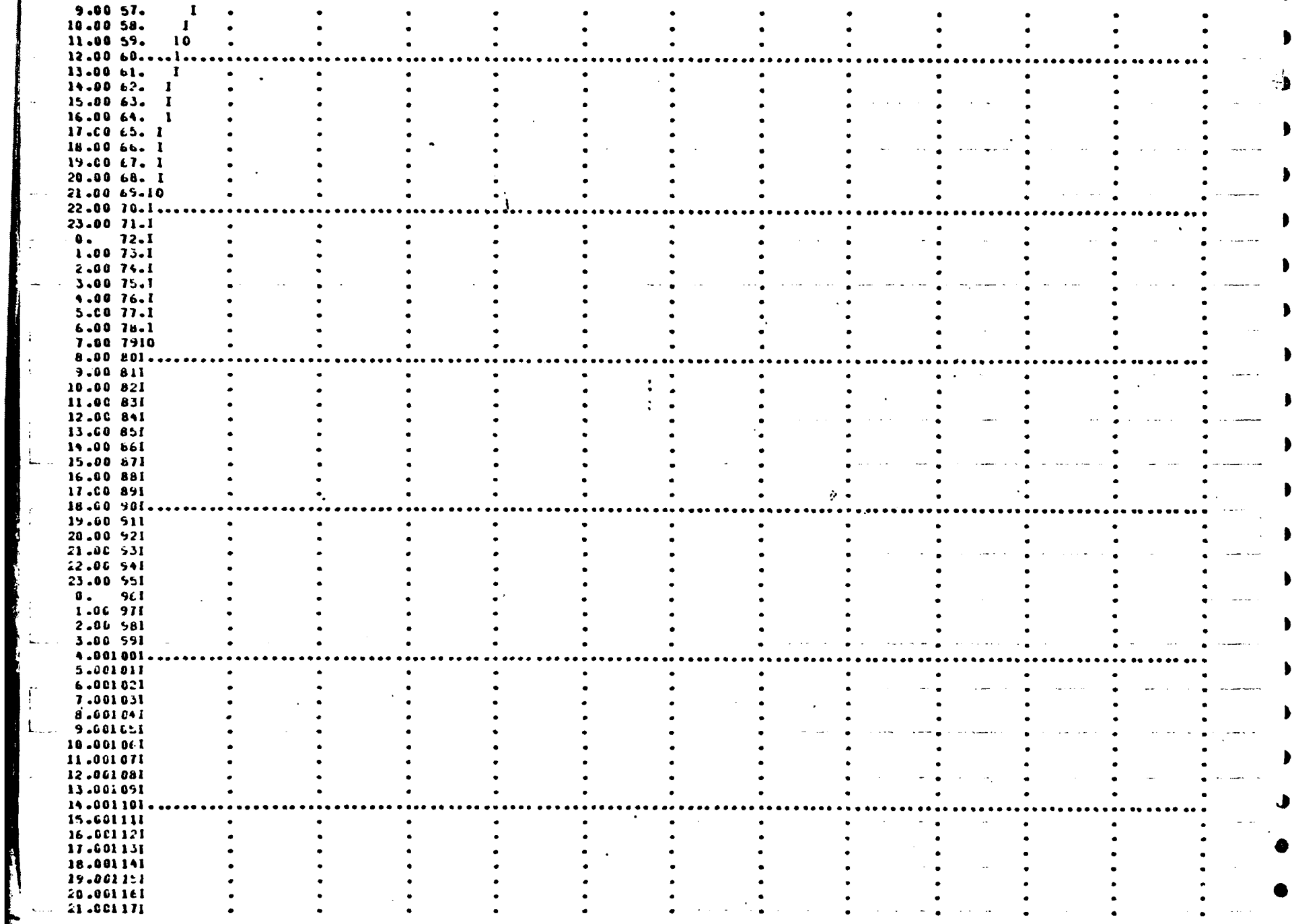
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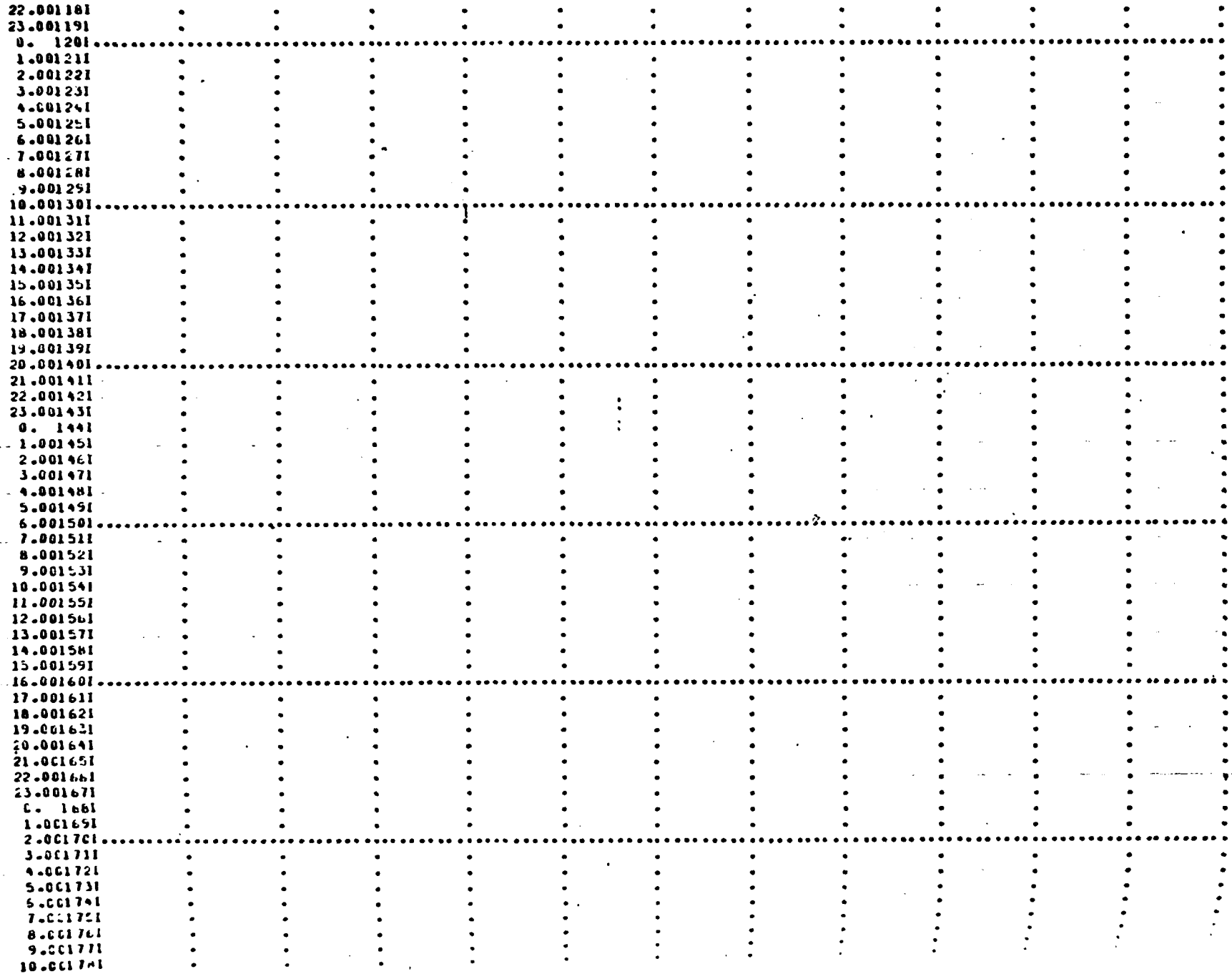
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 8.002001
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PEAK FLOW AND STORAGE (END OF PERIOD) SUMMARY FORMULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
FLOWS IN CUBIC FEET PER SECOND (CUBIC METERS PER SECOND)
AREA IN SQUARE MILES (SQUARE KILOMETERS)

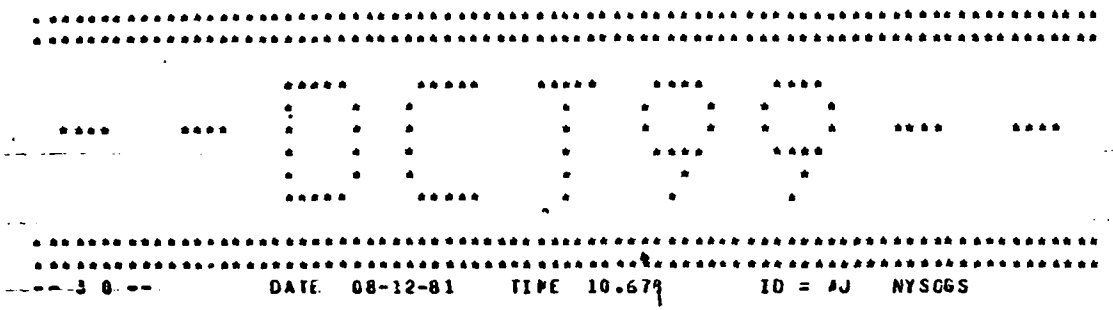
OPERATION	STATION	AREA	PLAN	RATIOS APPLIED TO FLOWS					
				RATIO 1	RATIO 2	RATIO 3	RATIO 4	RATIO 5	RATIO 6
				0.20	0.40	0.50	0.60	0.80	1.00
HYDROGRAPH AT	1	18.51	1	5232.	10464.	13080.	15696.	20928.	26160.
		(67564.67)		(148.15)(	296.31)(	370.39)(	444.46)(	592.62)(	740.77)(
ROUTED TO	1	18.51	1	5222.	10430.	13033.	15675.	20889.	26087.
		(67564.67)		(147.87)(	295.35)(	369.07)(	443.88)(	591.52)(	738.76)(

SUMMARY OF DAM SAFETY ANALYSIS

PLAN 1 .....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	1061.00	1061.00	1070.00
STORAGE	172.	172.	309.
OUTFLOW	0.	0.	7921.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
0.20	1068.48	0.	276.	5222.	0.	44.00	0.
0.40	1071.03	1.03	333.	10430.	4.00	44.00	0.
0.50	1072.05	2.05	357.	13033.	6.00	44.00	0.
0.60	1073.04	3.04	381.	15675.	8.00	44.00	0.
0.80	1074.95	4.95	429.	20889.	9.00	44.00	0.
1.00	1076.78	6.78	478.	26087.	11.00	44.00	0.



-- 3 0 -- DATE 08-12-81 TIME 10.679 ID = AJ NYSOGS

APPENDIX D

REFERENCES

AD-A109 837 NEW YORK STATE DEPT OF ENVIRONMENTAL CONSERVATION ALBANY F/G 13/13
NATIONAL DAM SAFETY PROGRAM. GLEN CREEK DAM (INVENTORY NUMBER N--ETC(U)
AUG 81 G KOCH DACW51-79-C-0001

UNCLASSIFIED NL

2 OF 2

END
DATE FILMED
02-82
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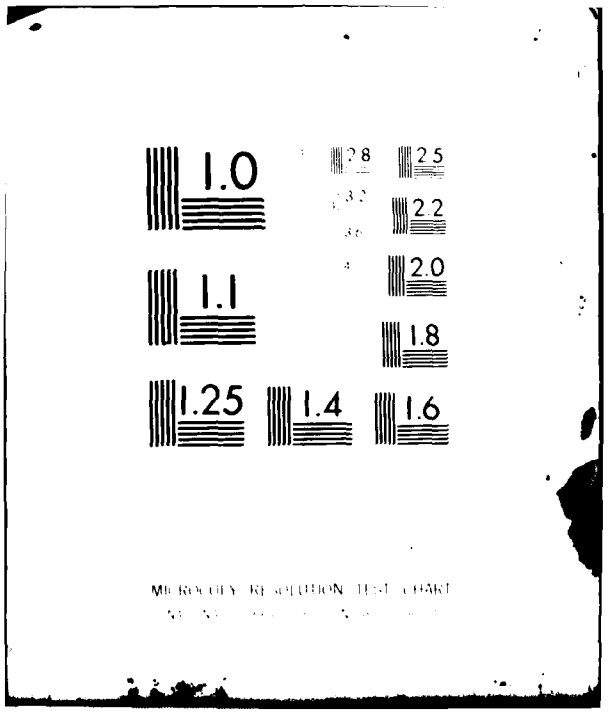
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MICROCOPY RESOLUTION TEST CHART

APPENDIX D

REFERENCES

1) U.S. Department of Commerce, Technical Paper No. 40, Rainfall Frequency Atlas of the United States, May 1961.

2) U.S. Department of Commerce, Hydrometeorological Report No. 33, Seasonal Variation of the Probable Maximum Precipitation East of the 105th Meridian for Areas from 10 to 1,000 Square Miles and Durations of 6, 12, 24, and 48 Hours; April 1956.

3) Soil Conservation Service, National Engineering Handbook, Section 4, Hydrology, August 1972 (U.S. Department of Agriculture),

4) H.W. King and E.F. Brater, Handbook of Hydraulics, 5th edition, McGraw-Hill, 1963.

5) T.W. Lambe and R.V. Whitman, Soil Mechanics, John Wiley and Sons, 1965.

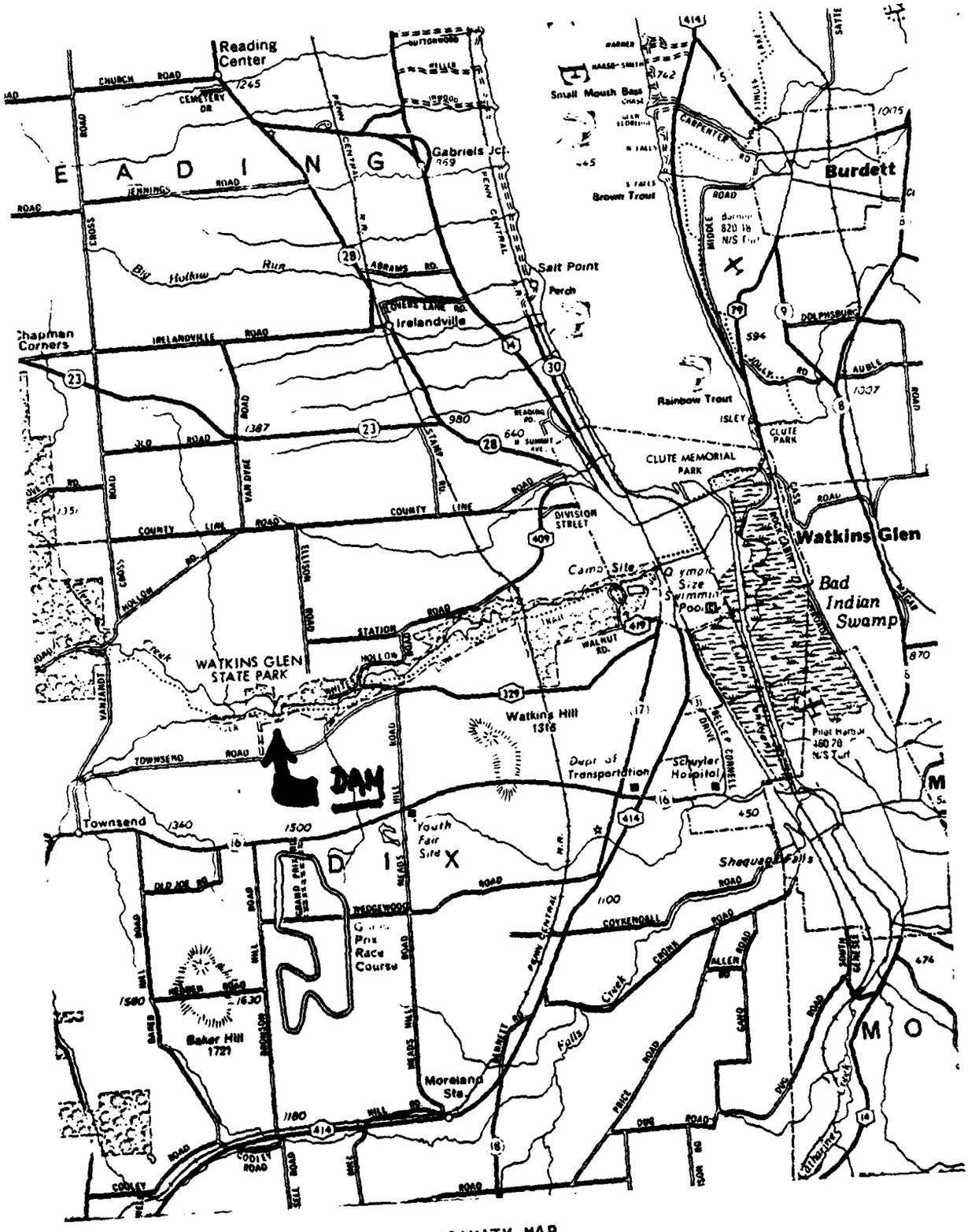
6) W.D. Thornbury, Principles of Geomorphology, John Wiley and Sons, 1969.

7) University of the State of New York, Geology of New York, Education Leaflet 20, Reprinted 1973.

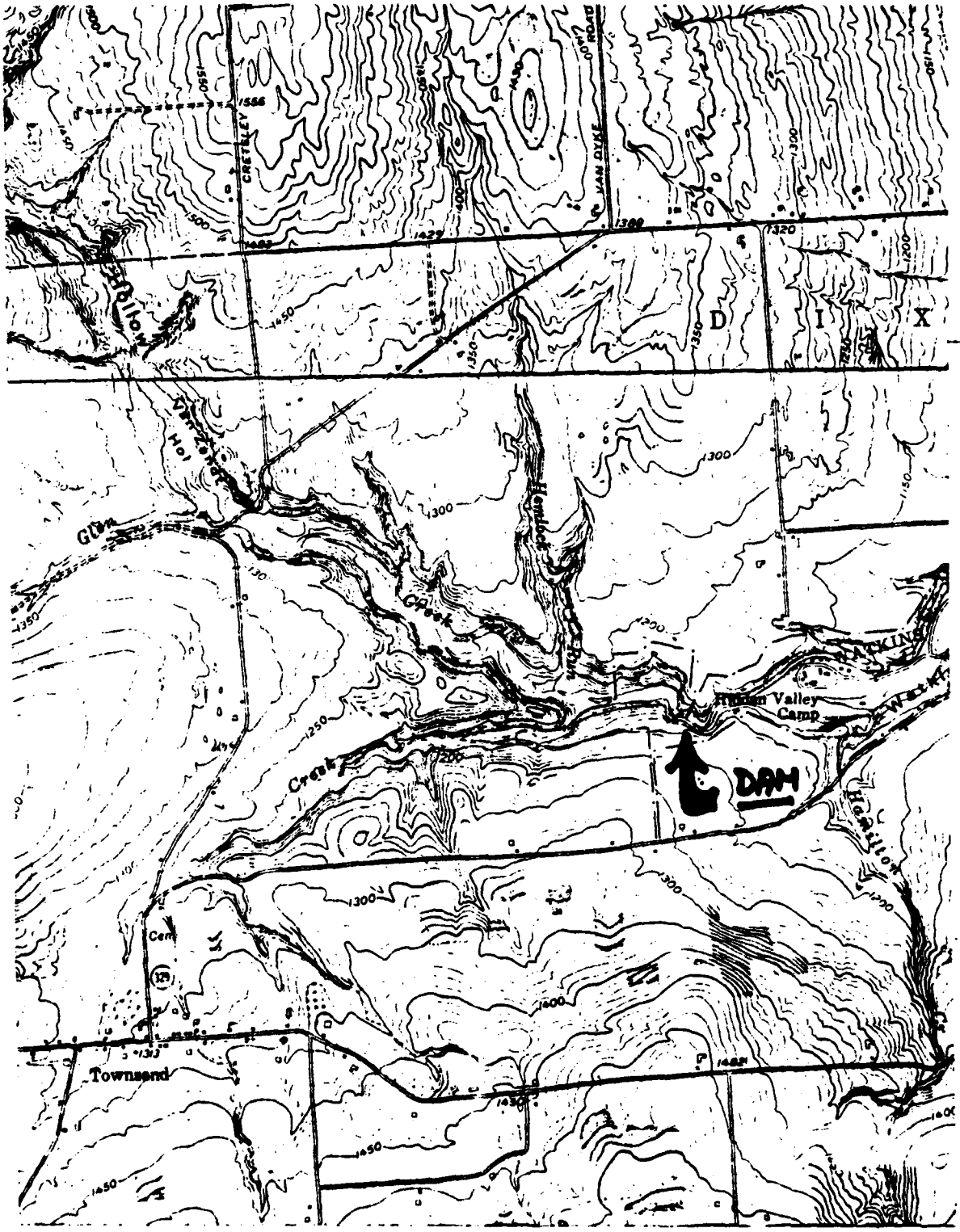
8) Cornell University Agriculture Experiment Station (compiled by M.G. Cline and R.L. Marshall), General Soil Map of New York State and Soils of New York Landscapes, Information Bulletin 119, 1977.

APPENDIX E

DRAWINGS

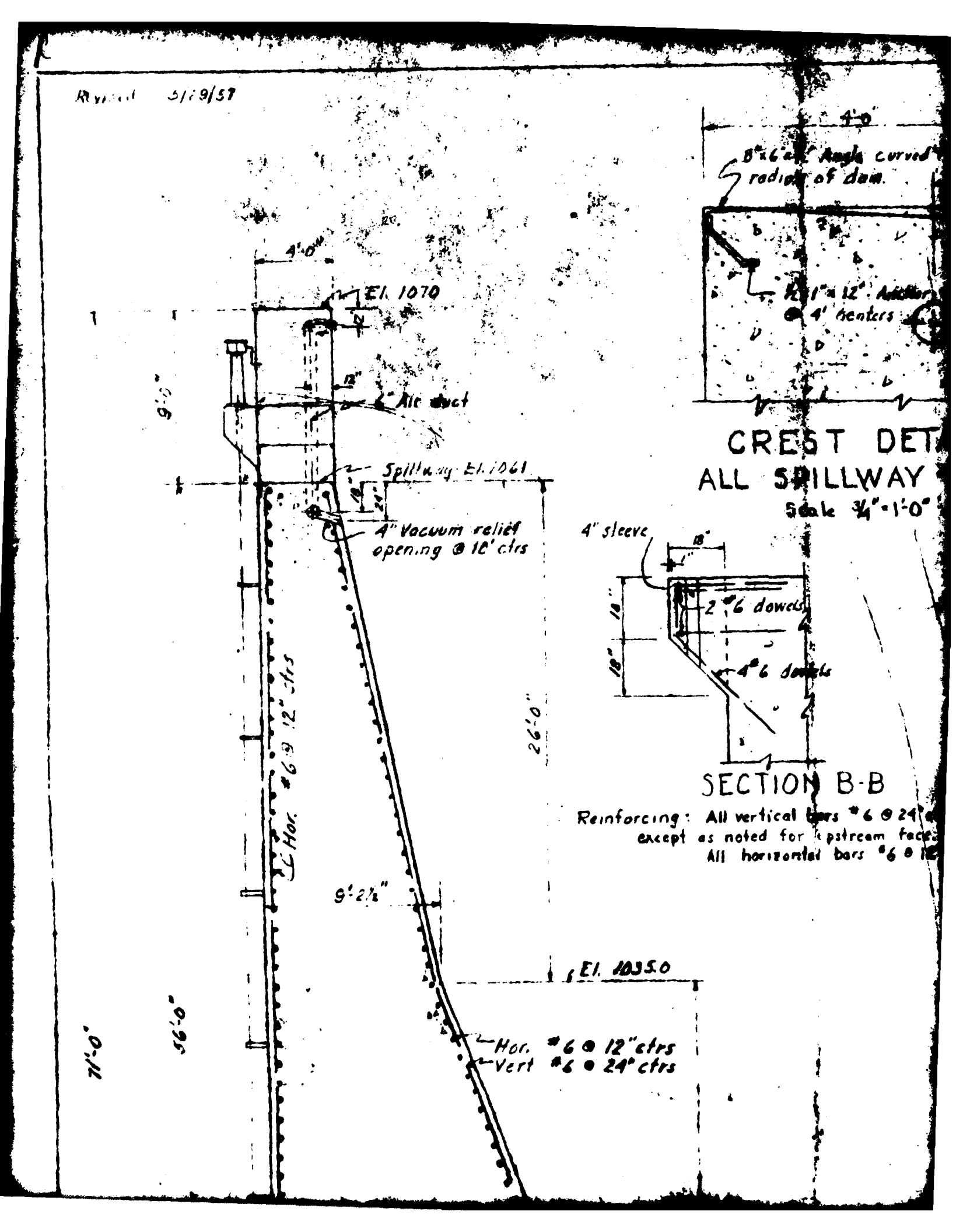


VICINITY MAP

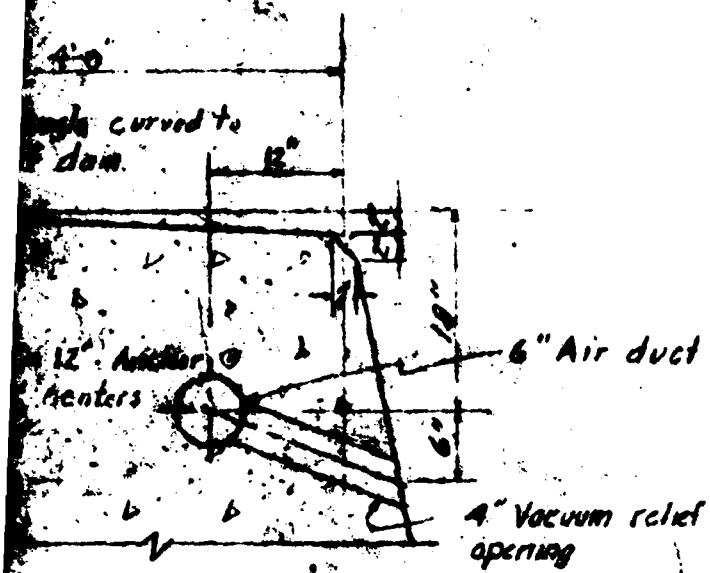


TOPOGRAPHIC MAP

Revised 5/19/57



12



T DETAIL

LLWAY SECTIONS

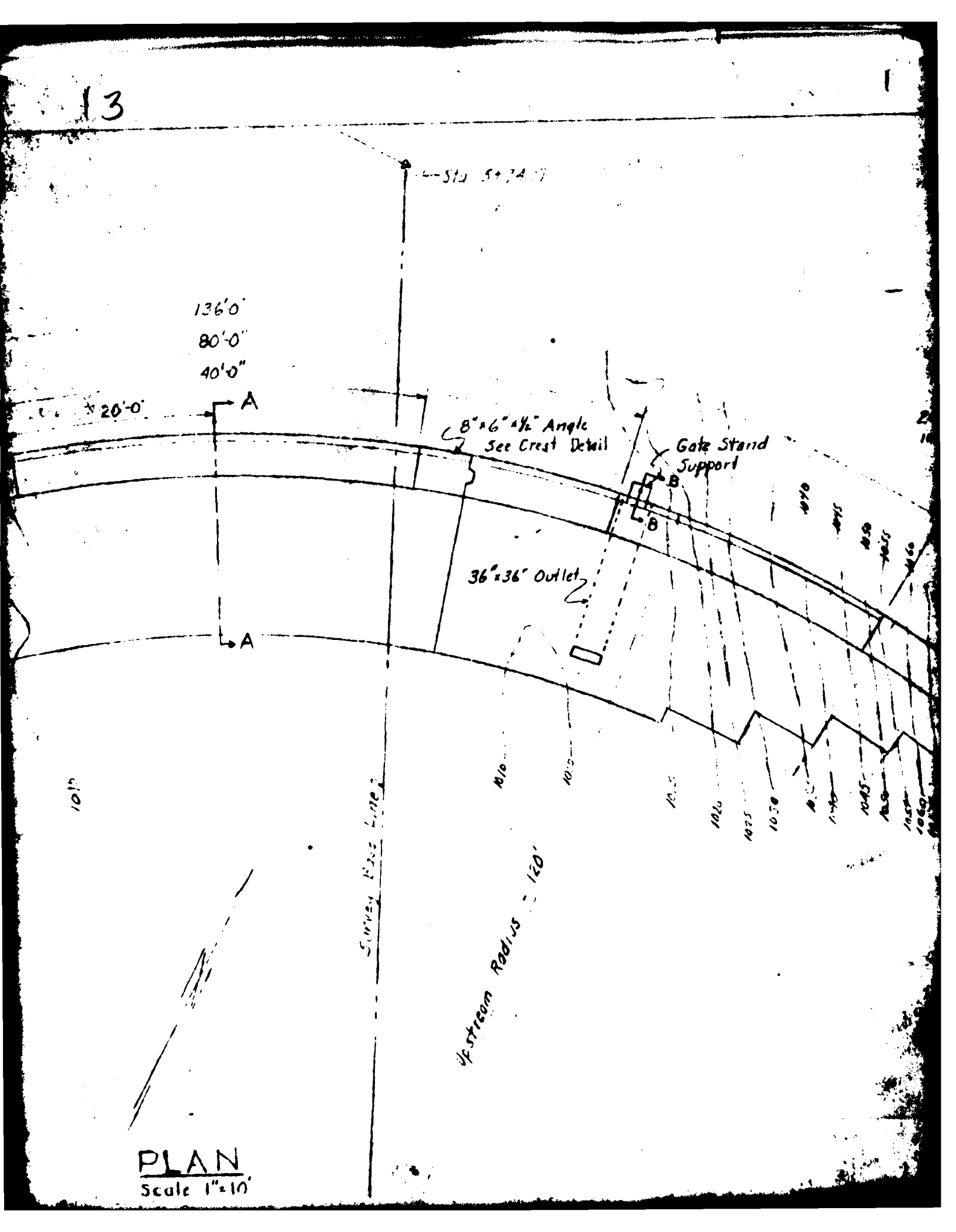
le 3/4"=1'-0"

B-B

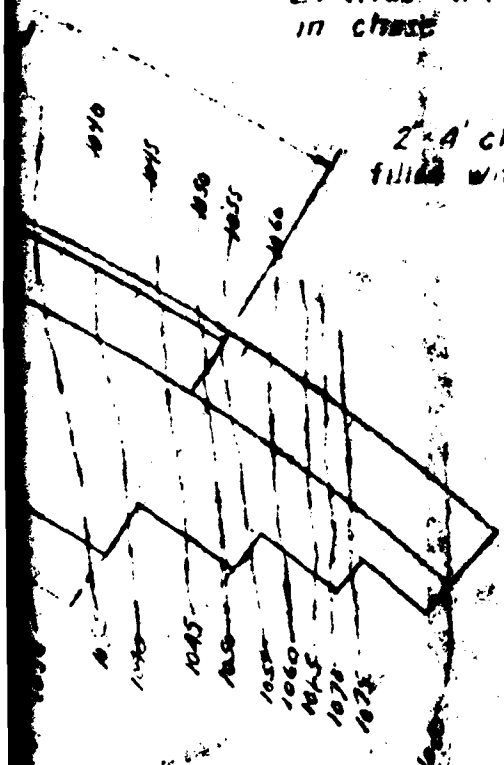
rs #6 @ 24" ctrs
pstream face.
bars #6 @ 12" ctrs.

1080
1075
1070
1065
1060
1055
1050
1045
1040
1035
1025
1020
1015

13

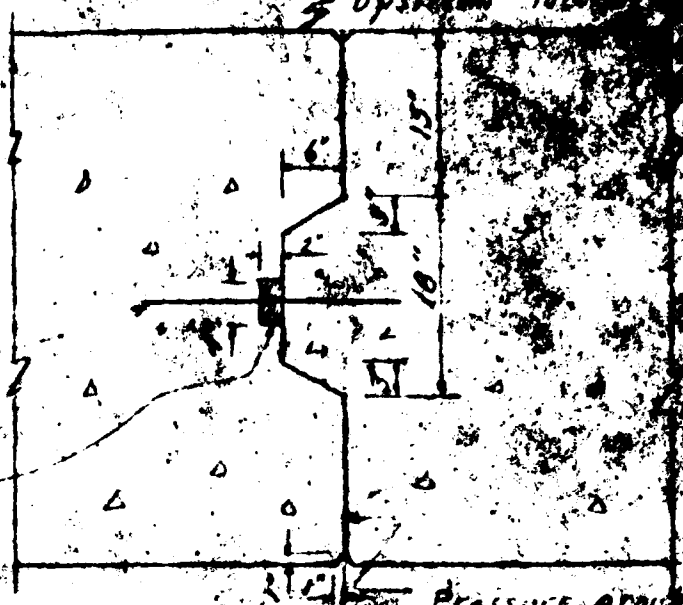


PLAN
Scale 1"=10'



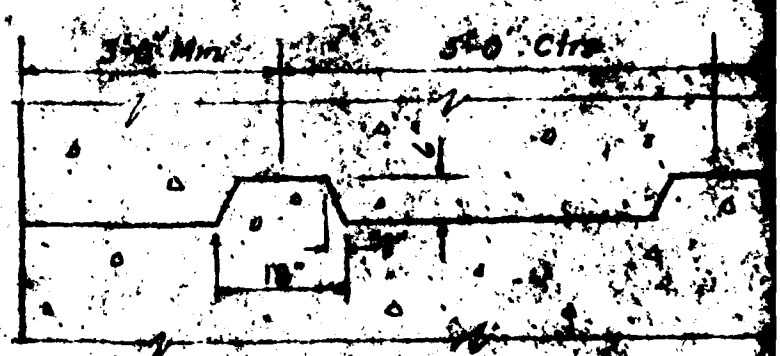
16 oz. copper sheet 24" wide with ½" crease in chase

2" x 4" chase to be filled with mastic



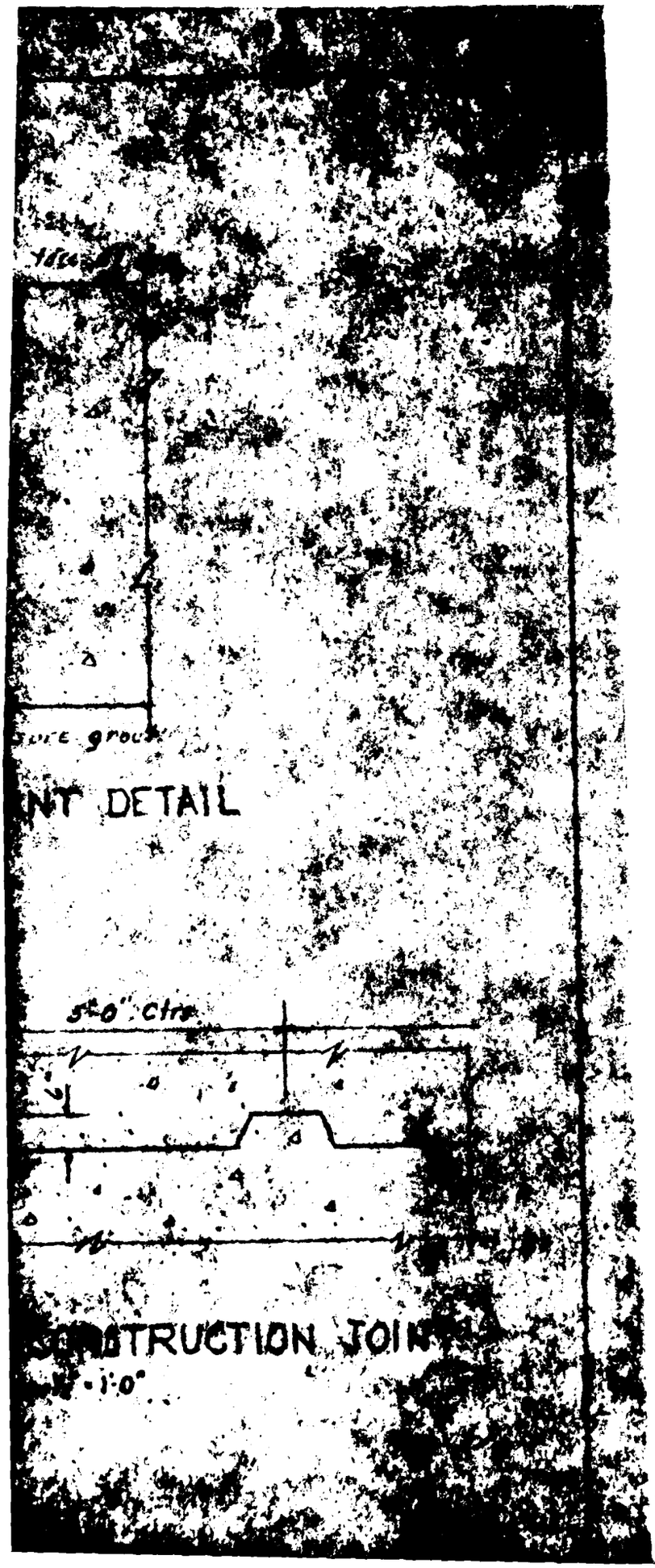
CONTRACTION JOINT DETAIL

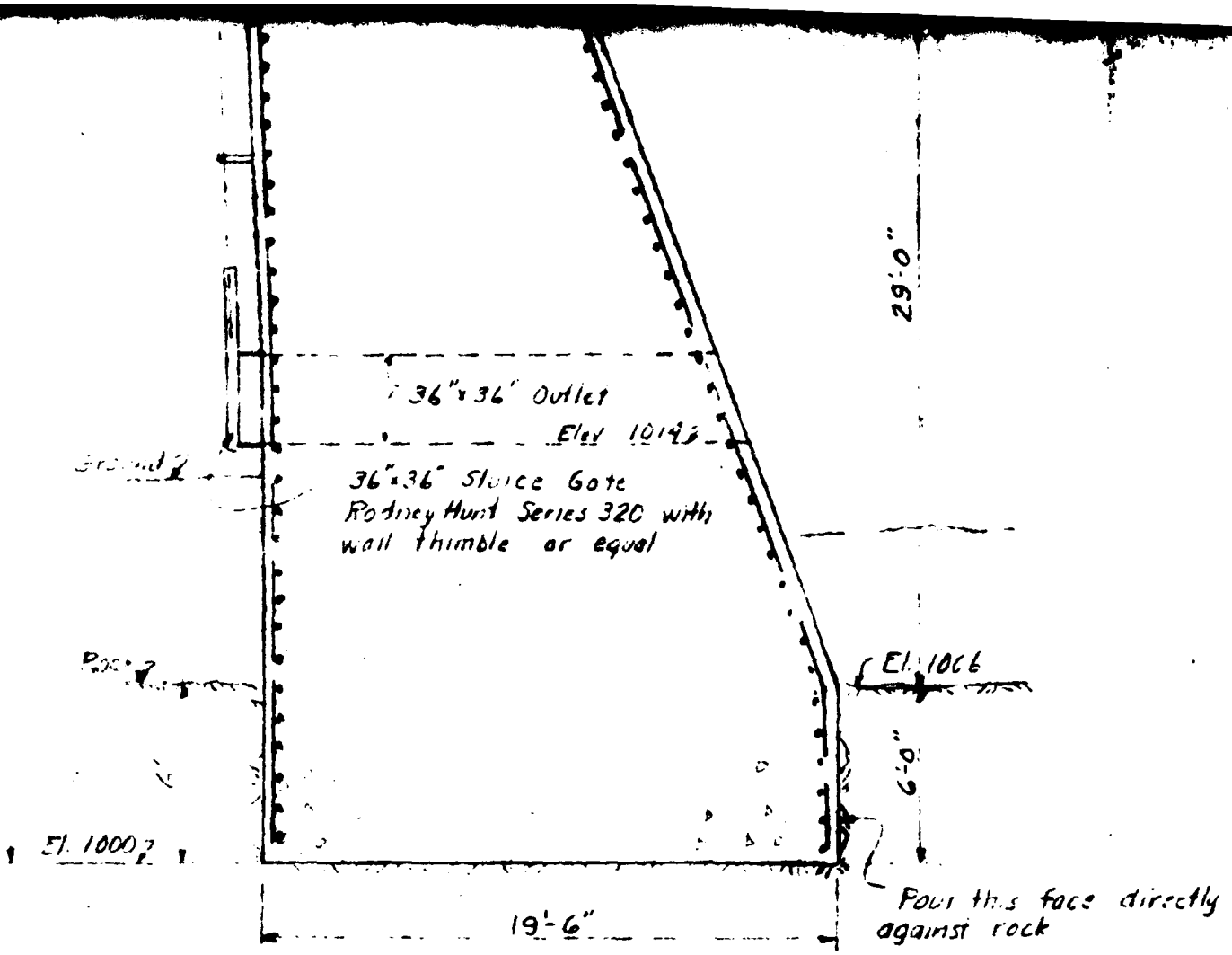
Scale ¾" = 1'-0"



HORIZONTAL CONSTRUCTION

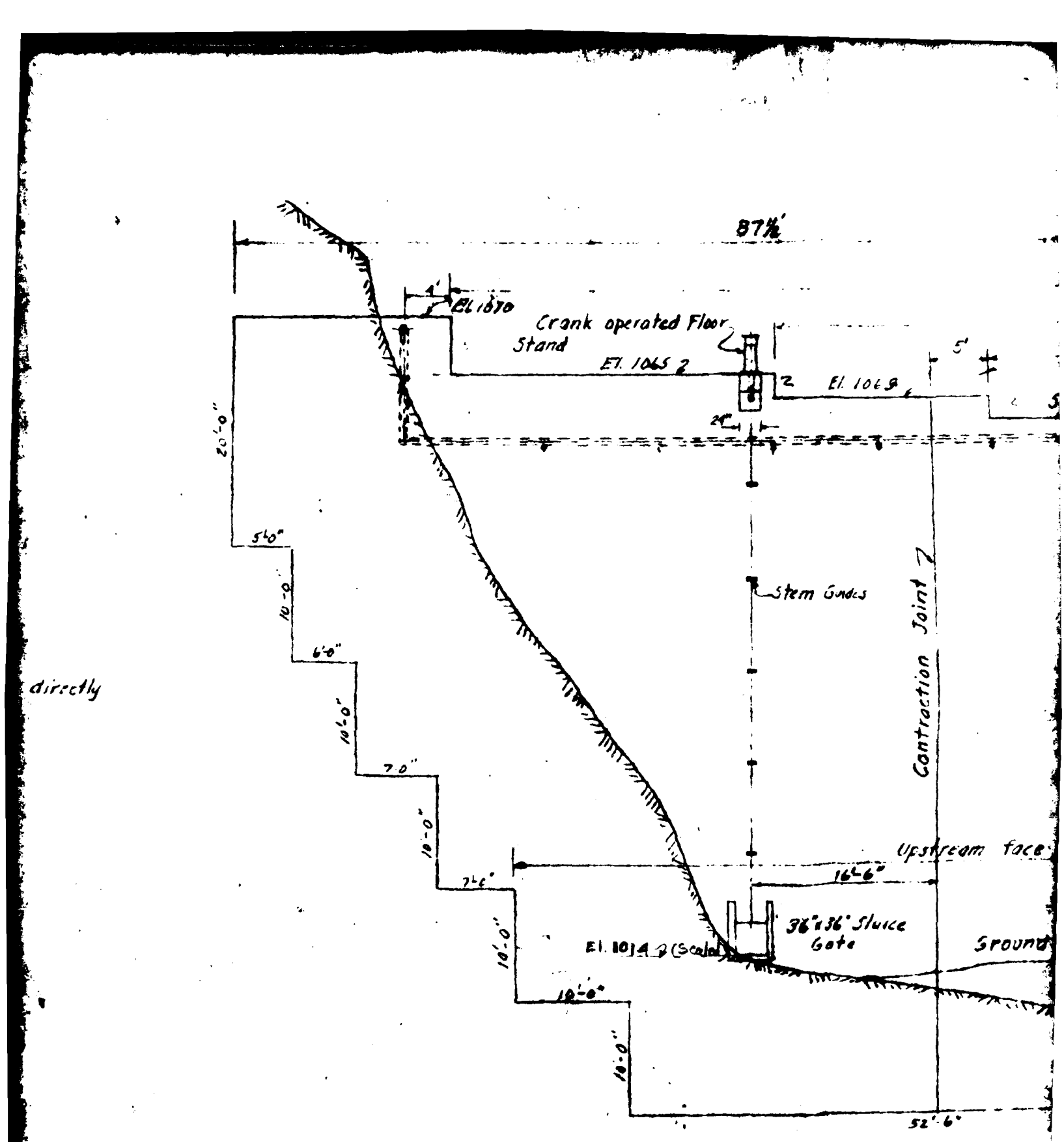
Scale 1'-0"


NT DETAIL
5'-0" ctrs.
STRUCTION JOINT



SECTION A A

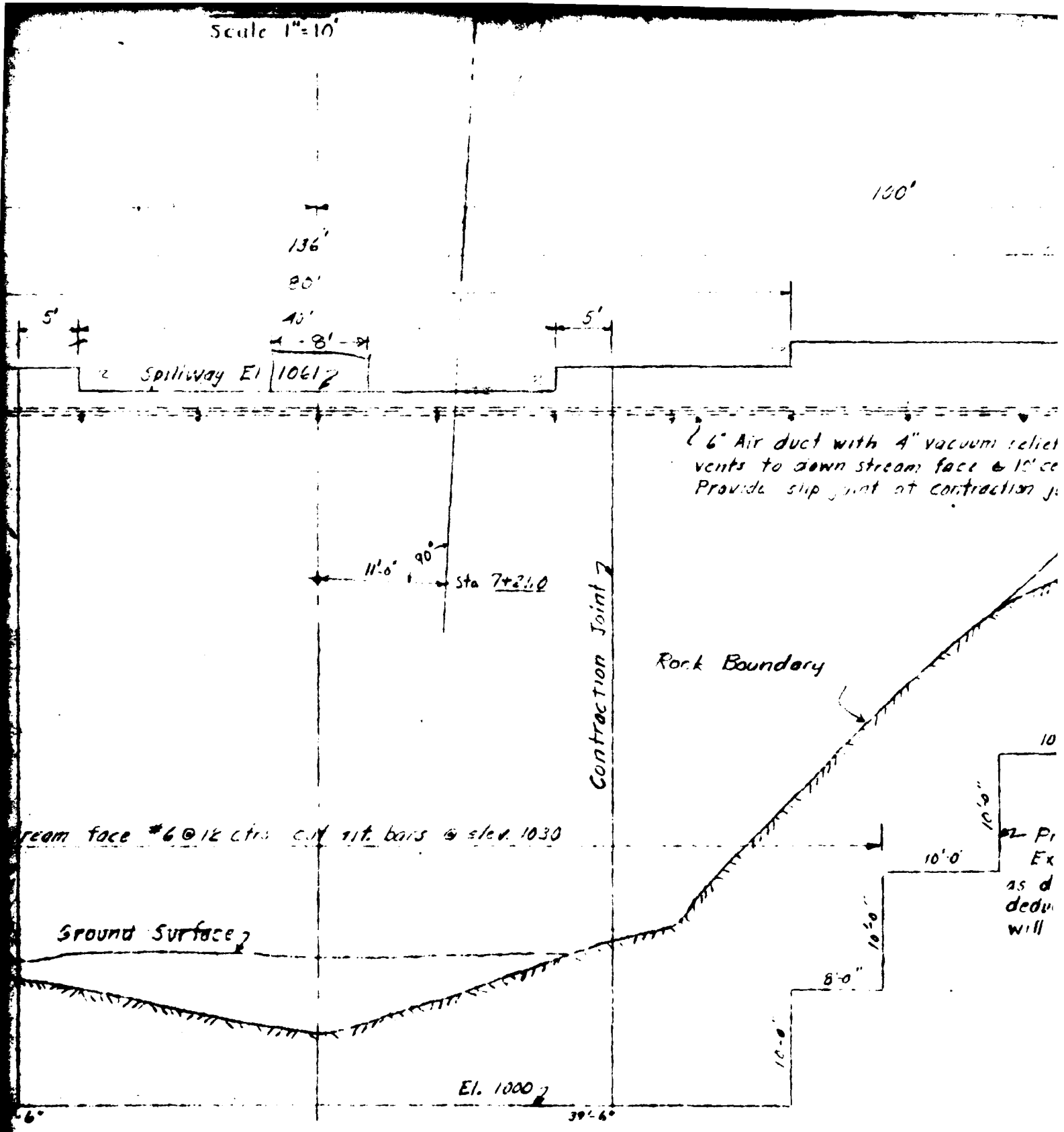
Scale 3/16" = 1'-0"



directly

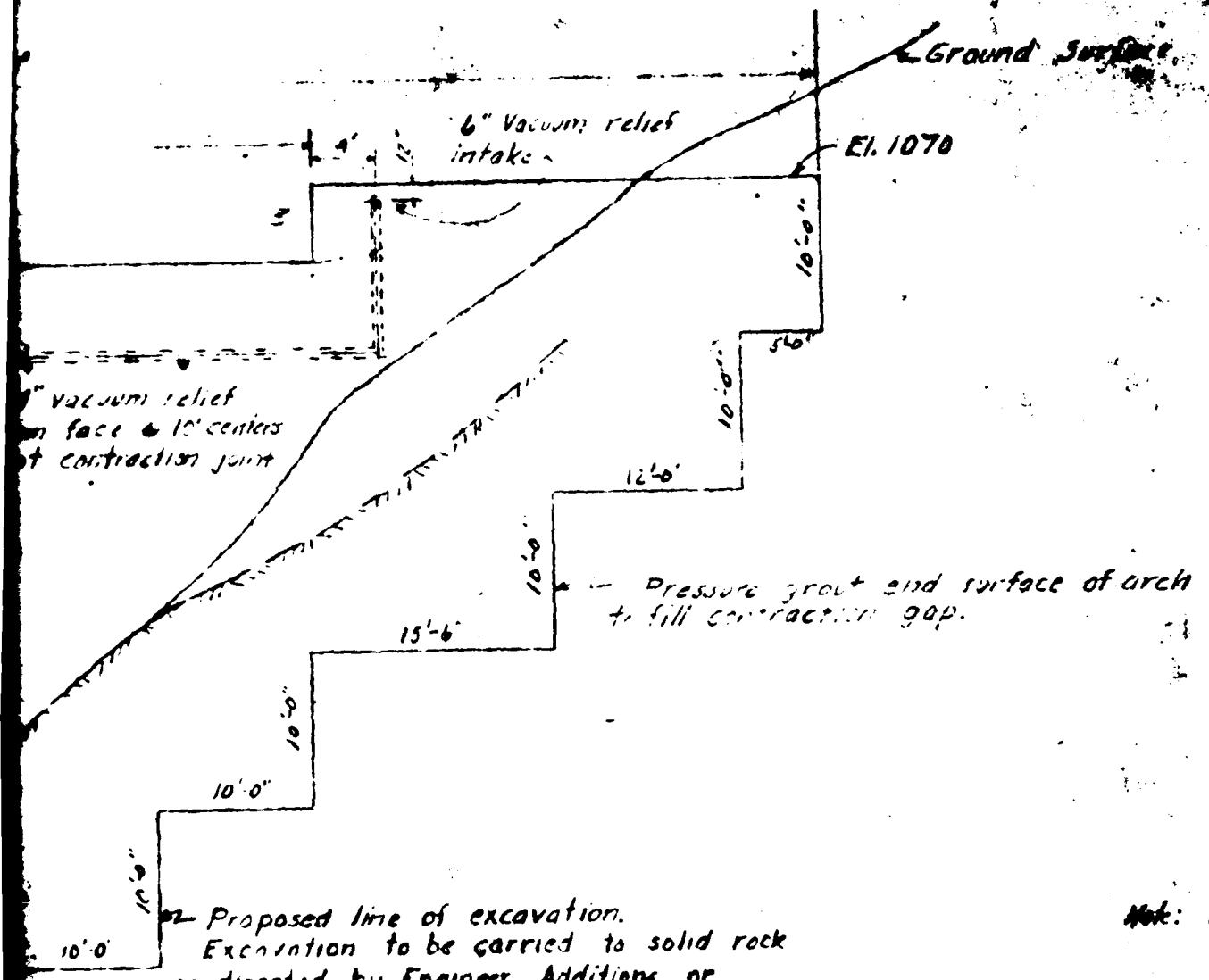
ELEVATION ALO

Profile



ALONG ARCH - LOOKING DOWNSTREAM

Profile along upstream face
Scale 1"=10'



Proposed line of excavation.
Excavation to be carried to solid rock as directed by Engineer. Additions or deductions in rock excavation and concrete will be paid for at unit price bid.

Note: For Location M

FINGER LAKES STATE PARKS
ITHACA, N.Y.

WATKINS GLEN STAT

GLEN CREEK

Scale: As shown May 19

For Location Map see Sheet 2

PARKS COMMISSION
CA, N.Y.
EN STATE PARK
CREEK DAM
May 1st... Sheet

1 10


DAT
FILM